
Nova Scotia Utility and Review Board

IN THE MATTER OF

*The Maritime Link Act, S.N.S 2012 c.9
and the
Maritime Link Cost Recovery Process Regulation, N.S. Reg. 189/2012*

NSPML Quarterly Report Q1 2020

April 15, 2020

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1 **1.0 INTRODUCTION**

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3 This is the Q1 2020 Quarterly Report for the Maritime Link as directed by the Utility
4 and Review Board (UARB) where the UARB ordered in its Supplemental Decision:

5

6 [115]....detailed reports must be filed by NSPML on a semi-
7 annual basis, on June 15 and December 15 each year. The reports
8 shall commence December 15, 2013. Updated status reports must
9 be filed quarterly.

10

11 As per the UARB’s order in its Decision regarding the Maritime Link Interim Cost
12 Assessment (M07718), this Report now includes detail regarding the status of the
13 construction of Nalcor’s assets.

14

15 This Decision also requested that the quarterly reports include an accounting of all
16 transactions related to this project, cash flow analysis, and a reporting of the financial
17 and other benefits realized for ratepayers from the Maritime Link prior to delivery of
18 the Nova Scotia Block and Nalcor market-priced energy. Given that the benefits to
19 ratepayers prior to the Nova Scotia Block and Nalcor market-priced energy are secured
20 by Nova Scotia Power through the Maritime Link, Nova Scotia Power will report on
21 these in its Quarterly Fuel Adjustment Mechanism Report.

1 **2.0 UPDATE OF PROJECT SCHEDULE**

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3 The Maritime Link was placed in-service on January 15, 2018.

4

5 Detail respecting the status of the Nalcor Project and Muskrat Falls is outlined in
6 Section 2.9.

7

8

9 **2.1 Gates and Milestones**

10

11 The Maritime Link was placed in-service January 15, 2018.

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13

14 **2.2 Safety**

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16 Improving the safety of Maritime Link is one of NSPML’s most fundamental strategic
17 objectives. NSPML consistently works to address and enhance safety through
18 coordinated activities and targets.

19

20 These initiatives are monitored by ENL’s appraisal of safety metrics on the basis of
21 established risk management principles; a core component of the ENL Safety
22 Management System (SMS). In all of its coordinated safety activities, ENL strives to
23 achieve a balance between assessed risk and the requirements of practical, achievable
24 and effective risk mitigation strategies.

25

26 There have been no recordable incidents to date in 2020 and operations staff are
27 adhering to safety protocol established in response to COVID-19.

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2.3 Commercial Activities

The key major procurement activities are presented in Table 1 with an update of the status for each initiative.

Table 1 Key Major Procurement Activities

Commercial Activity	Background	Initiative Number	Status in April 2020
HVDC Submarine Cable Supply and Installation	The Contract was awarded to Nexans in January 2014. Substantial Completion occurred in September, 2017. Contract Final Completion Certificate signed February 5, 2018.	E11-18	Closed
Converter stations, switchyards and related structures (“converters and structures”)	The Contract was awarded to ABB Inc. in June 2014. Final System Test Completed January 15, 2018. Substantial Completion achieved on January 15, 2018.	E12-74	System studies are being finalized, anticipated by Q3 2020.
Right of Way Clearing along Transmission Lines	Contracts were awarded to Majors Logging Limited in NL and to R. MacLean Forestry in NS in February 2014.	E13-88	Closed

Commercial Activity	Background	Initiative Number	Status in April 2020
Transmission Structures and Grillages	The Contract was awarded to Kalpataru Power Transmission Ltd. in September 2014 for design and delivery of Structures and Grillages.	E13-85	Closed
Site Preparation Services (Includes construction of access road upgrades)	The Contract was awarded to Joneljim Concrete Construction (1994) Ltd. for NS Site Preparation Services in September 2014. Contracts awarded to Marine Contractors Inc., MCI Limited Partnership for NL Site Preparation Services in September 2014.	E13-92	Closed Closed
Transmission Line Construction	E13-95 contract terminated as of late 2016. Contract replaced with E16-284 and E16-269 previously reported.	E13-95	Contract Closeout is in progress.
Transmission Line Construction – NL AC Line	The contract with PowerTel was re-assigned to NSPML for the completion of the two Grounding Lines and the HVAC Line. Final Completion was achieved January 31, 2019.	E16-284	Contract Closeout is in progress.
Transmission Line Construction - NL and NS HVDC Lines	The contract for the construction of the HVDC Transmission Lines was awarded to a joint venture of Emera Utility Services and	E16-269	Contract Closeout is in progress.

Commercial Activity	Background	Initiative Number	Status in April 2020
	Rokstad Power Corporation (ERJV).		
Transmission Line Conductors	<p>The Contract for the supply of conductors was awarded to Midal Cables in March 2015.</p> <p>The contract for the supply of OPGW was awarded to Composite Power Group Inc. in June 2015. This is also within the scope of the E13-87 initiative.</p>	E13-87	<p>Closed</p> <p>Closed</p>
Horizontal Directional Drill (HDD) Construction Program	<p>Contract awarded to Directional Horizontal Drilling (DHD) in January 2016.</p> <p>E13-157 was divided into two contracts.</p> <p>E13-157 A was awarded to Schlumberger in March 2016 for the supply of HDD fluids. E13-157B was awarded to Baker Hughes in April 2016 for the Supply of directional drilling services, drill bits and other materials.</p> <p>E13-158 for marine intervention services was awarded in April 2016 to DOF Marine.</p>	<p>E13-156</p> <p>E13-157</p> <p>E13-158</p>	<p>Closed</p> <p>Closed</p> <p>Closed</p>

Commercial Activity	Background	Initiative Number	Status in April 2020
	The supply of the HDD casing (E15-238) was awarded to East Coast Tubulars Limited in October 2015.	E15-238	Closed
Accommodations Operations	The contract for the accommodations operations services was awarded to East Coast Catering in April 2015.	E13-89	Closed

1

1 **2.3.1 Land Access Agreements**

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3 The vast majority of land rights are now in place, and NSPML is in the final stages of
4 securing these rights; moving to expropriation as required where agreement could not
5 be reached, or landowners could not be found. These easements do not impact the ability
6 of the project to complete contract closeouts or to operate according to plan.

7

8 **2.3.2 Funding**

9

10 The IE Certificates allow for Project costs to be paid from the proceeds of the Maritime
11 Link Construction Loan under the payment terms of the Material Project Documents
12 and the Maritime Link Credit Agreement. There was a draw certificate requested in
13 February 2020 which was the final draw on the \$1.3 billion proceeds. The IE does not
14 issue a Certificate specific to draws that occur after Commissioning such as this most
15 recent draw. Any such draws must be approved by the Collateral Agent acting on
16 Canada's behalf.

17

18 **2.3.3 Joint Development Agreements**

19

20 NSPML continues to work with Nalcor and NS Power to finalize the remaining
21 operational agreements arising from the Formal Agreements with Nalcor. Please refer
22 to Attachment 1 for details on the status of these Agreements, which indicate four
23 Agreements remain to be concluded.

1 **2.4 Engineering Activities**

2

3 Engineering is captured in three main categories across several Work Breakdown
4 Structures (“WBSs”):

5

6 • HVDC Submarine Cable Supply and Installation - Completed.

7

8 • HVDC Converters and Substations – All HVDC Converters and AC Substations
9 drawings are complete and have been accepted. The second draft of the short
10 circuit protection study (and the associated system models) has been received
11 and is under review.

12

13 • Overland Transmission – All project as-builts completed.

14

15 **2.5 Submarine Cables**

16

17 Following the 2019 subsea cables survey, an assessment of the current state of the cable
18 protection system is ongoing which will help inform the scope of any additional
19 remedial rock protection required. The Cable Integrity Risk Assessment (CIRA) model
20 is being updated to incorporate the 2019 survey and trenching results and to develop the
21 redfish fishery probabilistic risk assessment component. The updated CIRA model will
22 support decision-making on the scope of any necessary remedial rock protection.

23

24 The team continues to engage the Department of Fisheries and Oceans (DFO) and the
25 redfish industry representatives with the objectives of promoting cable awareness and
26 safety considerations, and to stay informed about changes to redfish quotas, timing of
27 seasons, and harvesting methodologies. Information obtained through this process is
28 supporting the development of the redfish fishery probabilistic risk assessment
29 component of the CIRA model.

30

1 Planning is underway for the 2020 (year 3) cable inspection survey pending the potential
2 impact of COVID-19.

3

4 **2.6 Converters and Substations**

5

6 The Construction of the Converters and Substations was completed with the conclusion
7 of system testing and the Maritime Link placed in-service on January 15, 2018 and all
8 punch list items are completed.

9

10

11 **2.7 Transmission Lines**

12

13 ENL is finalizing multiple procurements with respect to Transmission works in 2020,
14 which will confirm the approach to the 2020 previously identified corrective work
15 related to Optical Ground Wire (OPGW) suspension clamps, OPGW/Overhead Shield
16 Wire (OHSW) jumpers, and conductors resulting from loose vibration dampers. Design
17 changes have been made to the OPGW clamp connection and corrective work is
18 ongoing. The solution for the jumpers and dampers is still under evaluation. NSPML
19 was forecasting to address all three issues by Q3 2020; however, the uncertainty caused
20 by COVID-19 may affect this schedule. ENL continues to progress both warranty and
21 insurance claims.

22

23 Work on the rerouting of a short section of the NL HVAC line near Southwest Brook
24 began in October, 2019; required due to soil erosion on the hillside near the base of three
25 structures. Three of four structures and associated anchors have been installed. The
26 fourth structure will be erected during the tie-in outage. Materials to complete the work
27 are on order, with completion of work originally planned for Spring 2020; however, it
28 is possible that this work may be delayed due to COVID-19.

29

30 The overhead transmission system continues to perform well through the second year
31 of operations with no significant reliability or downtime impacts experienced.

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2.8 Independent Engineer

NSPML has entered into a contract with the Independent Engineer (IE) related to the Operations phase of the Maritime Link, as per the Federal Loan Guarantee requirements. Site visits will continue to occur routinely, and the IE will provide annual confirmation to Canada and the Collateral Agent that the assets are being operated and maintained appropriately. The IE conducted a site visit in October 2019; please refer to Attachment 2 for the report.

2.9 Status of Nalcor Project and Muskrat Falls

Nalcor’s latest project update, published in mid-April for the end of February, indicates that overall construction of the Muskrat Falls Project is greater than 99% completed¹.

Nalcor has reported the following progress:

- The Muskrat Falls Generating Facility is 98% complete.
- The Labrador-Island Transmission Link (LIL) remains at over 99% complete, as Nalcor’s Contractor GE continues development of the P&C Software needed for operations.
- The transmission line connecting Churchill Falls to Muskrat Falls is 100% complete.
- Construction of the Labrador Island Transmission Link has been completed and the energization phase of the project began in June 2018.

¹ Muskrat Falls Project Monthly Report, February 2020, dated April 14, 2020, page 4, section 2.0.

1 For the Muskrat Falls Generating Facility:
2

- 3 • Commissioning activities continued for Unit 1, and work continued on units 2,
4 3 and 4 until the temporary pause of construction activities in response to the
5 COVID-19 pandemic described below. Commissioning of mechanical and
6 electrical systems to support first power from Unit 1 continued, and Mechanical
7 completion and commissioning activities also continued throughout the
8 Powerhouse until the COVID-19 escalation.

9
10 On March 17, 2020, Nalcor announced that it had temporarily paused construction
11 activities at the Muskrat Falls site in response to the COVID-19 pandemic. As well,
12 work at the Soldier's Pond site was temporarily halted as of March 28, 2020 as a result
13 of the COVID-19 pandemic. As a result of the effects of COVID-19 on Muskrat Falls
14 Project execution, Nalcor has declared Force Majeure under various Project contracts,
15 including formal notification to NSPML.

16
17 Prior to this, Nalcor had projected that Unit 1 of the Muskrat Falls Generating Station
18 ("MFGS") would be in commercial operation by mid-April 2020, with all four units
19 expected to be in service by the end of 2020. Respecting the LIL, Nalcor's last pre-
20 COVID-19 update had anticipated delivery of the final bi-pole P&C software to site at
21 the end of July 2020.

22
23 Since the pause of work at the construction sites in NL, Nalcor and its Contractor, GE,
24 have been able to safely continue development and testing of the interim Protections &
25 Controls (P&C) Software needed for operations and are nearing factory acceptance
26 testing.

27
28 Due to the unpredictable nature of the COVID-19 pandemic, Nalcor is currently unable
29 to provide an updated schedule for LIL or the generation project at Muskrat Falls and
30 intends to wait until there is greater certainty to update its Integrated Project Schedule.
31 NSPML is in close contact with Nalcor and we have been receiving regular updates
32 regarding the impact of COVID-19 on its operations and on the overall Project schedule,

1 as well as Nalcor's plans to mitigate these effects. Nalcor has expressed its desire to
2 resume work at site as soon as it is safe to do so for its employees, contractors and
3 associated communities.

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5 **2.10 Status of Benefits to NS Power Customers**

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7 Customer benefits received to date are being reported by NS Power with its Quarterly
8 Fuel Adjustment Mechanism Report.

1 **3.0 UPDATED COST SUMMARY**

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As per Enerco U-31, section 6, the details below outline the DG3 forecasted costs.

Table 2 provides an updated cost summary for the Maritime Link, which includes actual costs incurred as of December 31, 2019 and forecasted total costs for the remainder of the Project’s construction activities.

Costs associated with trenching the submarine cables as noted in section 2.5 (and associated with transmission line corrective work noted in section 2.7) are reflected in this report.

NSPML continues to track and report all costs, actual and forecast, consistent with the methodologies used in the cost forecast represented in the Maritime Link Project Application. Capitalized project costs include fully allocated costs for the entire Project Management Team, including contractors, employees, executives dedicated to the project, and NS Power seconded employees at affiliate mark-up rates according to the Affiliate Code of Conduct. All costs provided are in Canadian dollars.

Actual AFUDC has been tracked and recorded monthly up to December 31, 2017 and totals approximately \$209 million as of that date, which is below the \$230 million amount estimated at the time of filing of NSPML’s Application.

1 **Table 2 Updated Cost Summary for the Maritime Link Project**

2

(000's of Canadian Dollars)	Actual Costs							Estimate to Completion	Total Project Estimate at Completion (A)
	Description	2011-2017	2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019		
Emera NL Project Management Costs	169,653	15,789	2,741	1,140	2,390	538	192,251	(477)	191,774
Nalcor Project Support Costs	16,352	(136)	15	12	(28)	-	16,214	117	16,331
Construction and Engineering Initiatives	1,324,792	(630)	943	1,211	14,492	4,763	1,345,572	40	1,345,612
Environmental Approval	16,824	1,415	33	54	19	52	18,397	39	18,436
Submarine and related	331,319	(5,897)	-	-	14,711	3,593	343,726	(2,125)	341,601
Converters, structures, and other ancillary equipment	541,716	5,397	275	422	133	317	548,259	1,559	549,818
AC and DC Transmission	434,933	(1,545)	636	736	(370)	801	435,190	567	435,757
Total	1,510,797	15,023	3,699	2,363	16,854	5,301	1,554,037	(320)	1,553,717
Contingency & Escalation							-	23,637	23,637
Grand Total	1,510,797	15,023	3,699	2,363	16,854	5,301	1,554,037	23,317	1,577,354

3

4

5

6 Note: Remaining Contingency & Escalation funds will be drawn upon and allocated to the appropriate cost
7 category as required until Project completion. Such allocations are documented in the table after they have been
8 approved., An additional contingency draw is in progress which will update the last two columns at the right of
9 this table. This update will be reflected in the Q2 2020 report. Total forecast for Project completion continues to
10 be within \$1.577 M. No amount has been estimated in this forecast for the potential recovery, from third parties,
11 of costs relating to transmission repair work. Any such recovery will be used to reduce the final cost.

1 **Total Actual Project Costs at end of Q3 2019 Compared to Previous Forecast**

2
3 The total actual project capital costs incurred during Q3 2019 of \$5,301,000 are detailed
4 below:

- 5
- 6 • Emera NL Project Management Costs of \$538,000: Project management costs
7 continue to be incurred as work advances relating to closing out of contracts,
8 procuring and managing punch list and corrective activities, and ensuring
9 appropriate documentation is in place for project closeout and regulatory
10 purposes. NSPML has segregated these capital costs from costs relating to
11 operating and maintenance activities and have expensed such operating and
12 maintenance costs accordingly.
 - 13
 - 14
 - 15 • Environmental Approval (EA) of \$52,000: This reflects the cost of EA
16 monitoring and finalization of EA related compensation.
 - 17
 - 18 • Submarine and related costs of \$3,593,000: This reflects final costs associated
19 with the 2019 subsea cable trenching work that began in Q3 2019.
 - 20
 - 21 • Converters, structures, and other ancillary equipment of \$317,000: This reflects
22 the cost of NL Hydro and NS Power system upgrades and modifications, as well
23 as the procurement of material spares in both provinces.
 - 24
 - 25 • AC and DC Transmission of \$801,000: This reflects corrective transmission
26 activities.
 - 27

28 The Project capital cost remains within budget.

1 **4.0 COST FLOW**

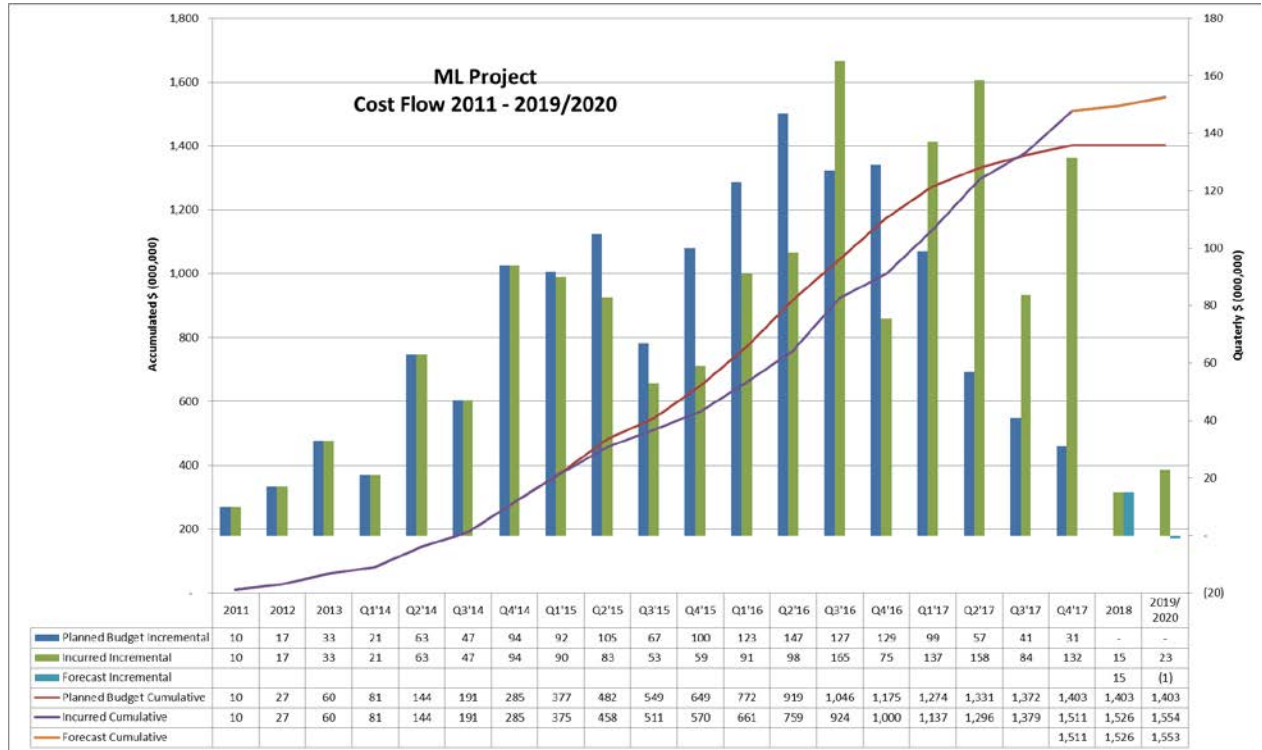
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As per Enerco U-31, section 2.2, please refer to Table 3 below for the cost flow of the Maritime Link. This cost flow report for the base capital spending is now forecast at \$1.554 billion; an additional contingency draw is in progress and will be reflected in the Q1 2020 report. The total of the base capital spending, escalation, and contingency amounts remains at or below \$1.577 billion.

The remaining budget includes forecasted costs relating to transmission corrective activities as well as completion of documentation and close out of payments to contractors, as well as regulatory and environmental requirements relating to the construction aspect of the project. Certain of these costs are expected to take place in 2020 and will require further draws on remaining budgeted contingency and escalation balances. The total forecast of base capital spending, escalation, and contingency amounts for the project remains at or below \$1.577 billion.

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Table 3 Maritime Link Cost Flow



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1 **5.0 INTERIM ASSESSMENT FINANCIAL UPDATE 2020**

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3

With the Maritime Link placed in-service on January 15, 2018, NSPML continues to

4

receive monthly cost recovery revenues from NS Power pursuant to the Board's

5

November 27, 2019 Order. NSPML forecasts its 2020 operating and maintenance,

6

debt and equity financing costs to approximate the amounts budgeted for the year.

Operating Agreement Requirements Arising from the Formal Agreements

	Agreement	Parties	Description	Formal Agreement Source	Status
1.	Asset Interconnection Agreement (NL)	Emera, NLH	Interconnection of ML with the Island Interconnected System	ML-JDA, s. 2.1 (c)	Completed
2.	Multi-Party Pooling Agreement	Emera, NLH	NLH (SO) to have operational control of ML NLH AC Upgrades	ML-JDA, s. 2.1 (d)	Completed
3.	Transmission Operating Agreement (NL)	Emera, NLH	NLH (SO) to have operational control of ML NL HVdc Facilities	ML-JDA, s. 2.1 (e)	Completed
4.	Asset Interconnection Agreement (NS)	Emera, NSPI	Interconnection of ML with NS bulk electric transmission system	ML-JDA, s. 2.1 (f)(i)	Completed
5.	Transmission Operating Agreement (NS)	Emera, NSPI	NS SO to have general operational control of the ML	ML-JDA, s. 2.1 (f)(ii)	Completed
6.	ECA – Metering and Measuring Standards – Transmission Losses	NSPML, Nalcor	Metering and measuring standards used in the calculation of Transmission Losses	ECA, Schedule 3, s. 5	Completed
7.	Regulation Service Agreement	NS Power NLH	Nalcor’s provision of the Regulation Service with respect to the Nova Scotia Block for the Initial Term	ECA, Schedule 5	Expect completion in 2020
8.	Metering and Measuring Standards – NS NTQ transmission losses	NSPML, Nalcor	Metering and measuring standards used in calculation of NS –NTQ Path Peak and Off-Peak Hour transmission losses	NSTUA, Schedule 3, s. 6	Completed
9.	NB Back-up Capacity Agreement	Bayside Power L.P, Nalcor	Emera’s provision of backup Capacity to NB to Nalcor until March 31, 2021	NBTUA, s. 2.1(d)	No longer required given sale of Bayside to NB Power.
10.	IOA – ML Transmission Procedures	NSPI, NLH	Rules and practices applicable to administration of transmission service over the ML	IOA, Schedule D	Completed
11.	IOA – Reserve Sharing	NSPI, NLH	Sharing of energy and reserves between the Parties to improve Reliability	IOA, Schedule A	Completed
12.	IOA – Description of Interconnection Facilities	NSPI, NLH	Description of Interconnection Facilities for which each Party is responsible	IOA, Schedule B	Completed
13.	IOA – Functional Operating Relationship	NSPI, NLH	Various matters relating to operating relationship	IOA, Schedule C	Completed
14.	IOA – Operating Procedures	NSPI, NLH	IOC to develop “operating procedures”	IOA s.7.2 and s. 7.4(a)	Completed

15.	IOA – Schedule A1.0	NSPI, NLH	Parties to prepare a plan for NLH participation in Reliability Assessment Program (“RAP”)	IOA Schedule A1.0	Completed
16.	ML TSA – ML Scheduling Process	Emera and Nalcor	Scheduling process applicable to the provision of Firm Point-to-Point Transmission Service	MLTSAs, Schedule 2	Completed
17.	Amendments to Formal Agreements	Emera, Nalcor	Amendments to Formal Agreements required by Sanction Agreement	Sanction Agreement	Completed
18.	Energy Access Agreement	Emera, Nalcor	Commitments regarding access to market priced energy	Compliance Filing, Appendix A	Completed
19.	Balancing Service Agreement	Emera, Nalcor	Nalcor commitment to provide balancing services from generation sources in NL for 25 years.	Energy Access Agreement Term Sheet, s. 7(g) and Appendix 1	Completed
20.	Assignment of Transmission Rights under ML(E)TSA	Emera, Nalcor	Assignment of Transmission Rights	ML(E)TSA, s. 3.3 (h)	Expect completion in 2020
21.	Assignment of Energy Access Agreement	Emera, Nalcor, NSPI and Nalcor Energy Marketing (NEM)	Assignment/assumption of Nalcor’s rights and obligations to/by NEM	EAA s. 15.1 (a)	Expect completion in 2020
22.	Assignment of Nalcor Master Agreement (EAA Schedule 2)	Nalcor, NSPI and NEM	Assignment/assumption of Nalcor’s rights and obligations to/by NEM	Nalcor Master Agreement s. 10.5 (a)	Expect completion in 2020
23.	JOA-Joint Operating Committee (“JOC”)	Nalcor and NSPML	Establish/Operationalize JOC	JOA s. 3.1, 3.5	Completed
24.	NS Transmission Utilization Agreement	Nalcor and Emera	Status of Emera firm Point to Point Transmission Service	NSTUA s.s.2.2 (a)-(c)	Completed



LCP - ML PROJECT

SITE VISIT REPORT OCTOBER 28 TO 30, 2019

Prepared for: Natural Resources Canada and Emera

IE Point of Contact: Nik Argirov

Date: February 07, 2020

Quality Assurance Statement

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1. GENERAL

Independent Engineer (IE) team participated in the site visit for the Maritime Link (ML) project. The site visit took place in the province of Newfoundland on October 29th and 30th 2019. Emera management representatives Norm Dimmell, Anne-Marie Curtis (by phone), Craig Snelgrove, Rory MacNeill, Kelly Devereaux and Roger Burton led the site meetings and accompanied the IE team listed below.

IE team:

- Nik Argirov (IE Team Lead)
- Vlad Kahle (IE Electrical SME)
- Hamdy Khalil (IE Transmission Lines SME)

Trip itinerary:

October 28/ 29:

- Arrive and overnight in Deer Lake NL

October 29:

- Site visit and meeting at Bottom Brook
- HVac Transmission Line reroute inspection
- Overnight in Stephenville NL

October 30:

- HVdc Transmission Line inspection
- Depart to Halifax NS and Toronto

October 31:

- Travel to home bases

2. NEWFOUNDLAND PROJECT SITES – OCTOBER 29 AND 30, 2019

The Newfoundland portion of the project includes: (a) approximately 142 km of steel tower 200 kV HVDC transmission line from the existing Bottom Brook substation to Cape Ray, (b) approximately 26 kilometers of grounding line from Bottom Brook to Indian Head and (c) approximately 160 km of Wood H-Pole 230 kV HVAC transmission line from Bottom Brook to Nalcor's existing Granite Canal Hydroelectric Generating Station. The associated infrastructure includes: (i) a converter station and substation expansion at Bottom Brook, (ii) a switchyard at Granite Canal, (iii) a transition compound, (iv) 2 km of underground cable and an onshore cable anchor at Cape Ray and (v) a marine ground site at Indian Head.

Transportation to Bottom Brook and transmission line sites was by road.

2.1 Technical Meeting in Bottom Brook

a) Safety:

- Approximately forty contractor employees have been working on sites during the annual maintenance shutdown period, all completed the requisite orientation.



- There were no reportable injuries during the reporting period.

b) Environmental Update:

- There were no moderate or serious environmental incidents.
- Three minor oil spills occurred during the period but none reached the watershed.
- Two minor glycol releases to marine environment were reported.
- All marine activities were completed with no moderate or significant incidents.

c) Transmission Line Update:

- All HVdc TL dampers are to be replaced in 2020 with Stockbridge style.
- In 2019 10% of the existing dampers in problematic area will be replaced to evaluate the in-service performance. Photo 1 shows the problematic damper and photo 2 shows the replacement damper. The final solution may yet be with a different model damper.
- OPGW (optical ground wire) clamps will be replaced with a new clamp and an additional longer bracket to allow 100 degree swing to prevent the clamps from contacting the structure. Photo 3 shows the existing clamp damage and photo 4 shows the crew replacing the damage damper with a new one with longer bracket at structure 290.
- In 2019, 10% of new clamps with the longer brackets will be installed in problematic area to evaluate their in-service performance with the intent to have them fully (100%) replaced in 2020.
- OPGW/ OHSW bond wire on the HVdc lines will be replaced with braided copper conductor. Small number of bonding wires was broken; warranty claims are being pursued with PowerTel.
- In 2019, 10% of the braided conductors will be installed to evaluate their in-service performance.
- Remediation of HVac transmission line problem areas near South West Brook is in progress. The transmission line is being re- routed between structure 842 and structure 846.



Photo 1: Problematic dampers



Photo 2: Replacement dampers



Photo 3: Damaged shield wire / OPGW clamp



Photo 4: Crew is replacing the damaged shield wire / OPGW clamp at STR 290



d) NL HVdc Line Status:

- 100% re-torquing program has been initiated. Inspection of the lattice towers to date found that less than 1% of the bolts were found loose.
- Replacement of damaged or missing steel members is in progress.

e) NS HVdc Line Status:

- 10% of the structures have been inspected and torqued. Very few problems were found.
- Replacement of damaged or missing steel members is in progress.

f) NL HVac Line Status:

- 10% climbing inspections are planned.
- All remedial work is slated for completion by December 20, 2019.
- Re-route for the section between structure 842 and 846 should be completed by December 2019 pending material availability. If not, then this work will be completed in 2020.

g) Grounding Lines:

- 20% of inspections have been completed.
- Remedial work target completion date is end of November 2019.

h) Vegetation Management:

- 2019 Program for NL HDDC and grounding lines has been completed. NS program will be completed in 2020.

i) Marine Update:

- Annual survey has been completed by contractors.
- The preliminary results indicate that conditions are stabilizing in the previously identified scour areas and at the POA HDD berm.
- Trenching has been done to targeted depth of 1 meter by Nexans. A 0.6 meter minimum depth was required to meet acceptance criteria over the route. The required Depth of Cover was achieved or exceeded for almost 100% of the route; remedial rock protection is being considered for short expanses of each cable where bedrock or large boulders prevented trenching with the capject systems.

j) Asset Management and Performance:

- EA (energy availability) by end of Q2 was 94.76%.
- One brief bipole outage was caused by incomplete back-up control computer transfer. Report to IE is pending.
- STATCOM availability (i.e. at least one available) was 100%.
- 2020 maintenance program was discussed. EMERA has the overall responsibility with ABB contracted to perform the annual outage maintenance. The Utility will do the balance of plant.

Post meeting note: IE commented on the 2020 Annual Maintenance Plan and AC Substation Maintenance Plan and furnished references for station battery testing.

2.2 Bottom Brook Converter Building

HVdc switchyard and converter building work has been completed and the equipment is fully operational.

3. HVAC TRANSMISSION LINE RE-ROUTE INSPECTION

Line re-route between structure 842 and structure 846 is in progress. Structures 843, 844, and 845 were in side slope area with unstable soil. The scope of work includes:

- The modification to structure 842.
- The replacement of structures 843, 844 and 845 in new route.
- The replacement of structure 846. New structure 846 is approximately 10m from the existing structure 846 and will be in the same existing alignment.
- Photo 5 shows new structure being installed and photo 6 shows the log anchor that is used for the anchor installation



Photo 5: New structure being installed



Photo 6: Log anchor for anchor installation

4. HVDC TRANSMISSION LINE INSPECTION

The following inspection items were completed:

- Grounding lines inspection up to 20% of the length in both provinces earlier in the year.
- 20% ground and 10% climbing inspections in NS.
- 100% climbing and torquing program which includes ground inspections in NL. At the time of the visit approximately 50% complete.

5. COMMENTS

Transmission line issues are being addressed by engineering and management.

Report to IE on bipole outage is pending.