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# **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 Q3 2022**

**October 20, 2022**

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1 **1.0 INTRODUCTION**

2  
3 This is the Q3 2022 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 NSPML’s Application for final  
12 approval of Maritime Link Project Costs and approval of the 2022 cost assessment  
13 (M10206), NSPML continues its quarterly reporting to the UARB by way of this Report,  
14 with such ongoing reporting including financial data comparing capital and operating  
15 expenditures against budgeted amounts, reports on the status of Muskrat Falls  
16 Generating Station and Labrador Island Link commissioning, outstanding contractual,  
17 warranty and insurance claims, final close out punch list matters, outstanding  
18 expropriations, and outstanding operating agreements yet to be finalized.

19  
20 Given that the benefits to ratepayers of the Nova Scotia Block and Nalcor market-priced  
21 energy are secured by Nova Scotia Power through the Maritime Link, Nova Scotia  
22 Power continues to report on these in its Quarterly Fuel Adjustment Mechanism Report.

23  
24 Please note that where information is currently available, responses to the NSUARB’s  
25 questions and requests in the letter regarding M10627 (NSPML’s Q2 Quarterly Report),  
26 have been incorporated into this report.

1 **2.0 UPDATE OF PROJECT SCHEDULE**

2

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

4

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

7

8 **2.1 Gates and Milestones**

9

10 On August 6, 2021, NSPML signed an Acceleration Agreement with Nalcor which  
11 commenced delivery of the NS Block starting August 15, 2021.

12

13 **2.2 Safety**

14

15 Safety is a fundamental core value and integral part of every aspect of NSPML's  
16 business.

17

18 NSPML continues to be risk-focused on the assessment of all work activities ensuring  
19 that all high-risk work is reviewed and evaluated both before commencement of  
20 activities and through post- completion evaluations.

21

22 There have been no recordable incidents to date in 2022.

23

24 **2.3 Commercial Activities**

25

26 All key major procurement initiatives are now closed.

1 **2.3.1 Land Access Agreements**

2

3 The majority of land rights are now in place, and NSPML is in the final stages of  
4 securing any outstanding rights; moving to expropriation for 54 parcels of land as  
5 required where agreement could not be reached, landowners could not be found, or title  
6 to a land parcel was imperfect. These easements do not affect the ability of the project  
7 to complete contract closeouts or to operate according to plan. The Newfoundland &  
8 Labrador Government has formalized the expropriation panel, and related land matters  
9 in NL are currently with the panel. All lands have been expropriated; however, there  
10 are some lands where owners could not be found where funds will be paid into trust, as  
11 well as a claim regarding mineral rights.

12

13 **2.3.2 Funding**

14

15 The final draw against the \$1.3 billion Federal Loan Guarantee was requested in  
16 February 2020.

17

18 **2.3.3 Joint Development Agreements**

19

20 NSPML continues to work with Nalcor and NS Power to finalize one agreement relating  
21 to regulation service. Nalcor/NLH has completed their filing with the NL PUB and there  
22 is now a tariff for regulation service in Newfoundland & Labrador. There are no  
23 outstanding issues to complete the Agreement; however, protocol needs to be  
24 established for when NS Power may choose to use the service (current operations are  
25 not constrained by this).

26

27 The two remaining agreements are internal matters to Nalcor as they relate to the  
28 assignment by Nalcor of these agreements to an affiliate. Nalcor is not contractually  
29 required to assign the agreements to an affiliate. The status of these agreements does not  
30 impact the ability of the company to operate in fulfilment of its obligations. Please refer  
31 to Attachment 1 for a listing of the Agreements.

1 **2.4 Engineering Activities**

2

3 During execution of the Project, engineering was captured in three main categories  
4 across several Work Breakdown Structures (“WBSs”):

5

- 6 • HVDC Submarine Cable Supply and Installation - Completed.
- 7 • HVDC Converters and Substations – Completed.
- 8 • Overland Transmission – Completed.

9

10 **2.5 Submarine Cables**

11

12 Confidential Attachment 2 and Attachment 3 contain the 2021 marine survey report and  
13 associated NSPML memo as requested by the Board (see M09939).

14

15 The 2022 survey campaign was completed in the third quarter with no new significant  
16 items observed and reporting is underway.

17

18 Nexans warranty under E11-18 expires November 30 2022 and the parties are engaged  
19 with respect to the transition.

20

21 As recommended by the Board in its Decision (see M10206 at paragraph [77]), NSPML  
22 has developed a document that describes the thermal characteristics of the ML cables  
23 using as-measured soil thermal resistivity data, appropriate sea bottom temperatures (as  
24 determined from the 2011 survey and seasonal swing information) and distributed  
25 temperatures sensing (DTS) data. This information was filed with the Board on  
26 October 3, 2022.

1 **2.6 Converters and Substations**

2  
3 The Converters and Substations have been in service since January 2018 and continue  
4 to perform well.

5  
6 **2.7 Transmission Lines**

7  
8 The overhead transmission system continued to perform well into the fifth year of  
9 operations with no significant reliability or availability issues experienced.

10  
11 The inspection program has been completed for 2022 with ground level, climbing and  
12 aerial (helicopter) inspections completed for all lines in NL and NS per planned  
13 inspection program. No major issues were identified in 2022.

14  
15 As outlined in NSUARB IR-18<sup>1</sup>, it was noted that the Maritime Link system performed  
16 well and remained energized during Hurricane Fiona.

17  
18 As identified in NSPML’s Q2 Quarterly Report, the total costs recovered to date for  
19 transmission damper replacement work and jumper repairs on the HVDC transmission  
20 line is \$1.8 million. The cost breakdown and expected overall recovery was outlined in  
21 NSPML’s confidential response to BW IR-25 in M10206.

22  
23 **2.8 Independent Engineer**

24  
25 NSPML remains engaged with the Independent Engineer (IE) related to the Operations  
26 phase of the Maritime Link, as per the Federal Loan Guarantee requirements.

27 The IE completed its review of NSPML’s 2021 Operations and Maintenance activities;  
28 please refer to Attachment 4.

29  
30 Please see Attachment 5 for the most recent IE site visit report from June 2022.

---

<sup>1</sup> NSPML 2023 Assessment Approval Application, M10708, NSUARB IR-18, October 12, 2022

1 **2.9 Status of Nalcor Project and Muskrat Falls**

2

3 **Muskrat Falls Assets**

4

5 All four units continue to operate (subject to periodic maintenance inspections) under  
6 control of the Newfoundland and Labrador System Operator (“NLSO”); however, Unit  
7 2 is offline as of October 13 for planned maintenance. Units 1, 3 and 4 are in operation.

8

9 **Synchronous Condensers at Soldiers Pond**

10

11 Synchronous condenser (“SC”) Unit 1 commissioning tests are ongoing, with a planned  
12 Return to Service date of December 2022. SC2 and SC3 are online. Only two  
13 synchronous condensers are required to allow the LIL to operate, so the outage to SC1  
14 does not affect LIL operation. NSPML will file the GE root cause analysis report, as  
15 requested by the UARB, once it becomes available.

16

17 **Labrador Island Link**

18

19 Coordination between the Newfoundland, Nova Scotia and New Brunswick system  
20 operators continues to ensure systems are ready and testing is coordinated.

21

22 Dynamic commissioning of the newest version of Labrador Island Link (LIL) software  
23 completed in August 2022. Online commissioning of the Maritime Link – Labrador  
24 Island Link runback protection scheme as well as the LIL475MW Overload testing was  
25 completed successfully on October 15, 2022. Trial Operations has now commenced as  
26 a contractual requirement between GE and NLH/Nalcor and will require operation of  
27 the LIL for 30 consecutive days without a trip attributed to the HVDC system. Testing  
28 of the LIL at levels greater than 675 MW requires elevated loads brought on by cold  
29 weather, anticipated to occur later this fall. With recent successful testing, system  
30 operators and security teams have turned their focus to 700MW tests scheduled for mid-  
31 November requiring significant regional cooperation to ensure system conditions can  
32 reliably support the testing.



1 NSPML is informed by NLH that there is sufficient stored capacity to begin high energy  
2 transfers on the ML on a consistent basis, with NS Power, NLH and NSPML working  
3 collaboratively to advance these higher power flows and consistent delivery of the NS  
4 Block and make-up and surplus energy.

5  
6 **2.10 Status of Benefits to NS Power Customers**

7  
8 Customer benefits received to date are being reported by NS Power with its Quarterly  
9 Fuel Adjustment Mechanism Report and otherwise in accordance with the Board's  
10 directions in Decision M10206.

11  
12 It is highlighted that during Hurricane Fiona the Maritime Link interconnection was  
13 configured and leveraged to provide substantial reliability benefits to Nova Scotia and  
14 Cape Breton in particular with the frequency control technology helping to bring  
15 stability to Nova Scotia in the event of a significant disturbance as well as helping to  
16 maintain generation online while restoration activities were ongoing. This greatly  
17 improved NSPI's ability to manage the grid and generation while significant system  
18 issues were experienced from the storm event.

19  
20 As an update to information NS Power witnesses provided during the recent General  
21 Rate Application hearing, fuel cost savings for customers since the effective date of  
22 the Acceleration Agreement (August 15, 2021) through to October 11, 2022 are ~\$195  
23 million (\$180 million for 2022 YTD) with forecasted 2022 YE savings being in excess  
24 of \$230 million since the Acceleration Agreement and over \$215 million for the 2022  
25 calendar year.

1 **3.0 UPDATED COST SUMMARY**

2

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

4

5 Table 2 provides an updated cost summary for the Maritime Link, which includes all  
6 actual costs incurred as of June 30, 2022 and forecasted total costs to close out the  
7 Project's construction activities. Both actual and forecasted totals have been updated to  
8 reflect The Board's decision relating to NSPML's Final Capital Cost Application.

9

10 NSPML continues to track and report costs, actual and forecast, consistent with the  
11 methodologies used in the cost forecast represented in the Maritime Link Project  
12 Application. Capitalized project costs reported to the end of June 2022 have been  
13 updated to reflect the Board's decision in relation to unrecoverable costs. Costs continue  
14 to be recorded in accordance with the Affiliate Code of Conduct. All costs provided are  
15 in Canadian dollars.

16

17 Actual AFUDC has been tracked and recorded monthly up to December 31, 2017 and  
18 has been adjusted from approximately \$209 million to approximately \$208 million in  
19 accordance with The Board's decision, and below the \$230 million amount originally  
20 estimated.

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

2

Description	Actual Costs							Total Project to Date	Estimate to Completion	Total Project Estimate at Completion (A)
	2011-2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022			
Emera NL Project Management Costs	194,834	966	657	950	(329)	(8,129)	276	189,225	5,881	195,105
Nalcor Project Support Costs	16,214	-	-	-	-	-	-	16,214	2	16,216
Construction and Engineering Initiatives	1,349,520	2,361	950	78	197	(12)	(1,448)	1,351,646	66	1,351,712
Environmental Approval	18,416	-	-	-	-	-	-	18,416	1	18,417
Submarine and related	343,449	-	-	-	-	-	-	343,449	2	343,451
Converters, structures, and other ancillary equipment	548,481	64	13	2	58	15	340	548,973	1,105	550,078
AC and DC Transmission	439,174	2,297	937	76	139	(27)	(1,788)	440,808	(1,042)	439,766
<b>Grand Total</b>	<b>1,560,568</b>	<b>3,327</b>	<b>1,607</b>	<b>1,028</b>	<b>(132)</b>	<b>(8,141)</b>	<b>(1,172)</b>	<b>1,557,085</b>	<b>5,949</b>	<b>1,563,033</b>

3

4

Note: Recovery of costs from third parties relating to transmission warranty claims continue to be advanced and will be reported once finalized.

5

6

7

### **Total Actual Project Costs at end of Q2 2022 Compared to Previous Forecast**

8

9

As reflected in Table 2, the total actual project capital costs incurred during Q2 2022 was a net credit of \$1,172,000, primarily relating to the recovery of a portion of the transmission insurance and warranty claims offset by land related cost and purchase of converter station equipment.

10

11

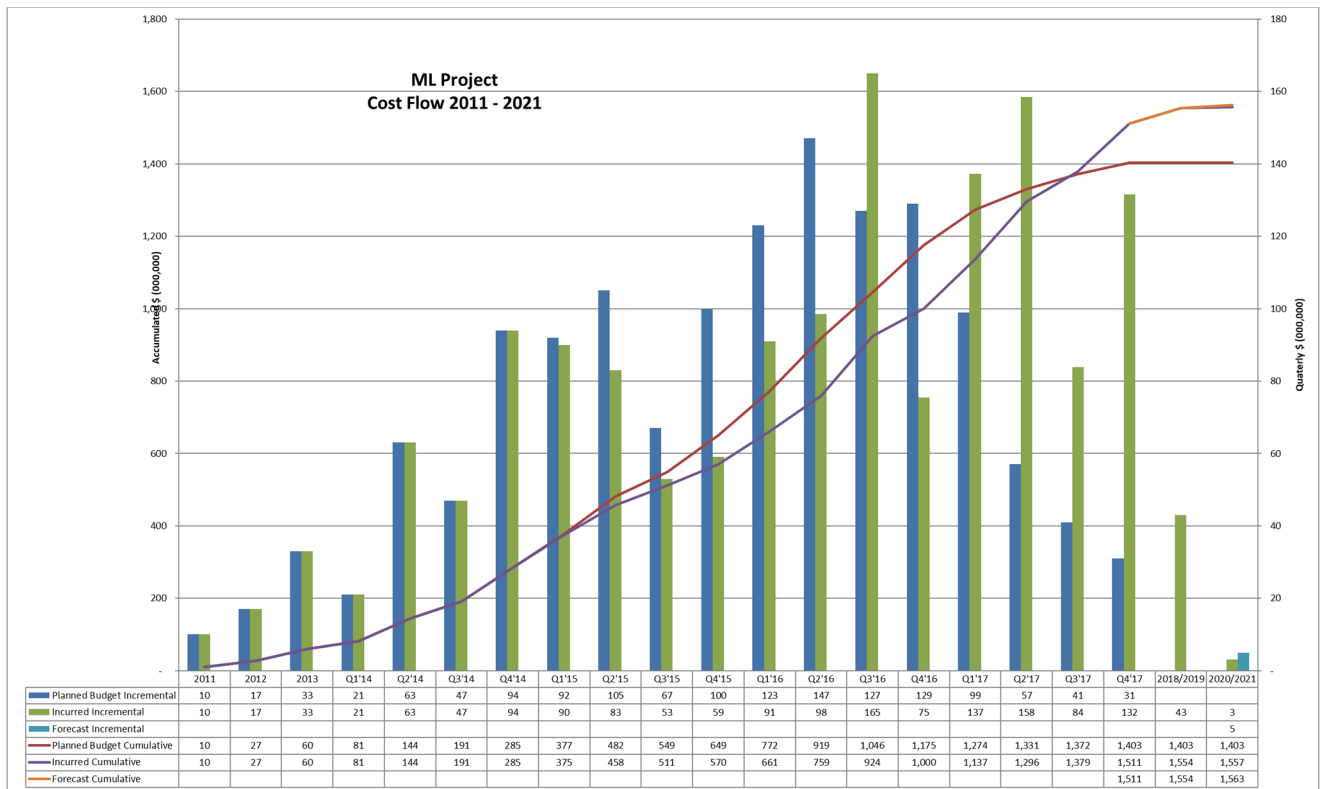
12

4.0 COST FLOW

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 forecast at \$1.563 billion in accordance with the Board’s decision relating to NSPML’s final capital cost application.

The remaining budget primarily relates to project close-out activities, including the settlement of warranty and insurance claims and outstanding land related items.

Table 3 Maritime Link Cost Flow



1 **5.0 ASSESSMENT FINANCIAL UPDATE 2022**

2

3 NSPML receives monthly cost recovery revenues from NS Power pursuant to the  
4 Board's order. NSPML anticipates that its 2022 operating and maintenance costs will  
5 be within the amount approved for the year.

6

7 With respect to the holdback mechanism, for the months of June and August, even  
8 including make-up energy in the calculations, the threshold of 90% deliveries was not  
9 achieved. Accordingly, \$4 million dollars has been expensed for the purchase of  
10 replacement energy in these months. The balance of the holdback funds remains  
11 allocated to the credit of the FAM account.

### Operating Agreement Requirements Arising from the Formal Agreements

	<b>Agreement</b>	<b>Parties</b>	<b>Description</b>	<b>Formal Agreement Source</b>	<b>Status</b>
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 2023.
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)	Completed
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)	At Nalcor’s discretion. Not a requirement of NSPML.
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)	At Nalcor’s discretion. Not a requirement of NSPML.
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

**Attachment 2 Maritime Link Cable Inspection Survey has been filed as Confidential.**





# Memorandum

**Date**      **October 14, 2022**

**Subject: NSPML Summary of Maritime Link Cable Inspection 2021 Survey Results Report, prepared by Horizon Maritime and Seaforth Geosurveys Inc.**

## **Reference Documents:**

1. D-000OP-0-950-05-253    2021 Survey Results Report    Horizon Maritime Ltd

## **Introduction**

During the fall of 2021, NSPML contracted Horizon Maritime to conduct a full-length survey of the two Maritime Link subsea cables and cable protection between Cape Ray (NL) and Point Aconi (NS).

The survey collected seabed multibeam bathymetric and sidescan sonar information, established depth of burial and collected subsea video data along the full West and East cable routes between Newfoundland and Nova Scotia. Using this data, the survey identified areas of interest such as any potential cable exposures, apparent free spans, neighboring material, notable seabed debris, and surface disturbances along the cable route.

The 2021 data is compiled with previously collected survey data and feeds accordingly into NSPML's risk modeling. The 2021 survey data that included updated depth of burial measurements is a key input to the continuing and ongoing assessment of short and/or long-term corrective maintenance requirements.

## **Comments**

The 2021 survey results re-affirm prior data that the cables are overall well protected with the following two items continuing to be the areas where monitoring and assessment are focused:

- Areas where localized sediment movement was reported in early surveys; these areas have not demonstrated further erosion or improvement indicating conditions are presently stabilized.

- Areas with previously identified freespan; while there are no out-of-specification locations identified, certain freespan in deepwater sections do not appear to be backfilling year-over-year.

While survey results to date indicate there is no immediate remediation required NSPML is evaluating the need for incremental protection for the interest areas noted above in consideration of the year-over-year protection status and trends. This assessment is expected to be completed in 2023 and will reflect upon survey results to date including the recently completed 2022 survey campaign.

The cables and the cable protection systems will continue to be monitored during subsequent planned surveys and inspections.

# MARITIME LINK: 2021 ANNUAL O&M REPORT

Prepared for: Natural Resources Canada and EMERA

IE Team Lead: Nik Argirov

Date: June 23, 2022.

## Quality Assurance Statement

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## 1. GENERAL

**Contractor:** Argirov Engineering Inc.

**Company:** NSP Maritime Link (EMERA) Spacing

### Annual Report Purpose:

Contractor is tasked to confirm that the budgeting and maintenance of the Maritime Link Project is being conducted in accordance with Good Utility Practice.

### Limitations and Exclusions:

For purposes of this Report the Contractor relied on the verbal and written information provided by the Company as well as on the observations and the information gathered during the singular Contractor's site visit (to NS in November 2021). Due to COVID-19 pandemic travel restrictions, the site visit to NL did not occur. Equipment inspections and the maintenance activities were not witnessed in person. Individual Work Orders and records of work done were not reviewed by the Contractor.

## 2. SCOPE OF THE REPORT

- (a) A summary of any material routine and unscheduled maintenance which has been conducted since the last report, as well as an updated review of expected major maintenance requirements, timing, and milestones.
- (b) A breakdown of costs incurred during the year covered by the applicable annual report with respect to operations and maintenance (O&M) including any variance from annual O&M budgets and a summary of any updates of O&M budgets.
- (c) A summary of any staffing, training, or labor management issues.
- (d) A list of changes to key personnel and the qualifications of new key personnel, if any.
- (e) Commentary on parts inventory and redundancy.
- (f) A review of construction contractors' support and the ongoing management of post-completion technical risks.
- (g) Ongoing compliance with major permits.
- (h) A review of the state of repair of key equipment and facilities.

## 3. DATA SOURCES

- [1] Maritime Link IE Update, 2021 Year End Review dated May 10, 2022
- [2] 2021 Org Chart for IE
- [3] Maritime Link Operations Q1, 2021 Operations and Maintenance Report, Doc. No. D-000ED-0-950-05-051 dated 007/15/2021
- [4] Maritime Link Operations Q2, 2021 Operations and Maintenance Report, Doc. No. D-000ED-0-950-05-052 dated 09/1/2021
- [5] Maritime Link Operations Q3, 2021 Operations and Maintenance Report, Doc. No. D-000ED-0-950-05-053 dated 1/17/2022
- [6] 2021 Annual OM Budget in Accordance with Article 11.5 of the ML Credit Agreement
- [7] Maritime Link Operations Transmission Contingency, 2021 Winter Update, dated FEB 17, 2021

- [9] Maritime Link Operations Annual Maintenance Plan- 2021, Doc. No. D-000ED-0-950-03-057 dated 31/8/2020
- [10] Maritime Link Minimum SSC, 2021 Winter Update, FEB 17, 2021
- [11] Maritime Link Diesel Generator, 2021 Winter Update, FEB 17, 2021
- [ ] Maritime Link Operations, 2021 Annual Operations and Maintenance Report, Doc. No. D-000ED-0-950-05-054 dated 03/31/2022
- [ ] 2021 Q1 Schedule J – Operating Report, May 28<sup>th</sup> 2021
- [ ] 2021 Q2 Schedule J – Operating Report, August 30<sup>th</sup> 2021
- [ ] 2021 Q3 Schedule J – Operating Report, November 29<sup>th</sup> 2021
- [ ] 2021 Q4 Schedule J – Operating Report, April 29<sup>th</sup> 2022
- [ ] ABB Maritime Annual Maintenance Summary, dated 17/06/2021
- [ ] Maritime Link Cable Inspection Survey, Survey Results Report, Doc. No. D-000OP-0-950-05-253 dated 11<sup>th</sup> Feb 2022
- [ ]

## 4. O&M INITIATIVES AND PERFORMANCE

### 4.1 Introduction

The Maritime Link is owned and operated by NSP Maritime Link Inc. (NSPML), a wholly owned subsidiary of EMERA Newfoundland & Labrador (ENL) Holdings Incorporated.

Commercial operation of the Maritime Link commenced on January 15, 2018. Resource development and competency training for Operations staff is ongoing, new staff inclusive.

Emera and NSPML staff were liaising with Nalcor for purpose of LIL HVDC commissioning and integration tests.

Objective of the IE review and of this Report is to ascertain if the assets are maintained in accordance with Good Utility Practice.

### 4.2 Safety

In 2021 ENL identified all work within the ENL-Task Inventory and quantified anticipated risk for all tasks. The Proactiv Rate (PAIR ) threshold target for 2021 was 1000 and ENL finished the year with a PAIR of 1107.

ENL recognizes that due to the tasks and nature of contracted work, there are areas of higher risk concern. New targets have been set for 2022; for contracted work observations will be 1:1000 person hours, while target observations for internal work will be 1:2000.

Safety Observations are a strong tool to promote cross-company understanding and engagement in work activities.

### 4.3 Pandemic Implications

NS-Travel to and between sites was limited to critical requirements; presence of contractors at sites was minimized.

Prescribed safety measures such as masking, distancing, screening, mandatory double vaccination, and extra cleaning were in effect.

NL-Practices similar to the ones at NS were implemented. Level 4 & 5 alerts were issued in Western NL in Q1/ Q2.



#### 4.4 Environment

During the Report period ENL was compliant with all environmental permits and regulations. Environmental Management System (EMS) commitments were completed. There were no Moderate or Significant environmental incidents. Environmental audit resulted in six minor findings; other EMS targets were achieved.

#### 4.5 Performance

##### Availability and Reliability:

- Maritime Link STATCOMS were extensively utilized for enhancement of reliability and economics.
- There were only three recordable forced outage events.
- LIL and the integration testing with runbacks were in the Company's focus in 2021

Additionally and in relation to availability in 2021, the Company closed out Transmission remedial work early in the year which required monopole outages. The Marine Survey work also entailed multi-day monopole outages in Q3/4.

##### CIGRE Performance Metrics:

	Q1	Q2	Q3	Q4	ABB Initial Availability Performance Guarantee	Targets
%EU	7.3%	11.8%	17.4%	20.9%		
%FEU	0.0%	0.01%	0.01%	0.02%		
%SEU	7.3%	11.8%	17.4%	20.8%	0.00%	≤1.25%
%EA	92.7%	88.2%	82.6%	79.2%	99.9%	>98%
BFO	0	0	0	0	0	0

##### Legend:

EU Energy Unavailability  
 FEU Forced Energy Unavailability  
 SEU Scheduled Energy Unavailability  
 EA Energy Availability  
 BFO Bipole Forced Outage

##### Maritime Link 2021 Active Power Availability:

Monopole: 96.7%  
 Pole 2: 81.7% (18.2% were planned outages, 0.04% forced outages)  
 Pole 1: 74.8% (25.2% were planned outages, 0.0% forced outages)  
 Bipole: 59.8%

### Forced Outages:

- *April 15, 2021- Personal Error:* An incorrect trip blocking procedure in NLH's work scope at the Bottom Brook AC site resulted in trip of ML Pole 2. Procedures were amended including scheduling of Protection maintenance for periods considered less risky to grid reliability.
- *July 11, 2021, and Dec. 10, 2021- Valve Cell Capacitance:* Abnormal cell capacitance reading caused Pole 2 trip at Woodbine. This incident followed trend of alarms recurring since 2018. Metallic shield around the capacitor measurement boards did not resolve the issue. Capacitor calculation algorithm is in the process of being changed pending modelling, trip function was temporarily disabled, and the capacitance is monitored on daily basis.

### Follow-up Items

- *Emergency Diesel-* Tests conducted by the original commissioning agency failed to uncover significant deficiency in the Emergency diesels generators Protection systems. Incident review following the HVDC bipole outage determined that the generator alternators at both WB and BBR have to be replaced. Replaced and reconfigured equipment was re-commissioned and testing procedures were amended to include regular operational testing. This item is closed.
- *Review of Commissioning Records-* In order to verify efficacy of the initial commissioning procedures, a proportionate sample of Project commissioning records were reviewed. Review uncovered gaps in commissioning records such as; (a) absence of records for breaker failure protection, (b) initiation to AC substation, and (c) failure to 'field verify' low voltage switchgear breaker settings. Documentation will either be sourced for these items, or additional tests to confirm those functions are pending.
- *Temporary De-rating-* System conditions at the 230kV bus in Bottom Brook NL caused by low short circuit levels require temporarily de-rating of the Maritime Link. Studies determined the necessary de-rating levels as well as the requirements for Special Protection System (SPS) and procedural protocols. Three dual redundant SPS systems were approved and designed. The hardware is currently in fabrication stage to be installed at Bottom Brook Terminal 2 by Q3 2022.
- *Valve Cell Capacitance-* Trip function is temporarily disabled, and the capacitance is being monitored on daily basis. Final solution is pending.

## **4.5 Maintenance Highlights**

### HVDC Converter Stations

Pole 1 and Pole 2 planned HVDC System shutdown maintenance items were completed as planned. During this year 1700 Planned Maintenance (PM) activities were conducted on the HVDC System.

### HVAC Substations

All planned and critical corrective maintenance work was completed at Woodbine, Bottom Brook, and Granite Canal.

### Overhead Transmission and Grounding Lines

- 100% of the 2514 planned ground-based, climbing, and aerial Transmission line inspections were completed.
- NL HVAC Transmission Line- 134 OHSW jumpers were replaced.
- NL HVDC Transmission Line- 1910 dampers were replaced.

- NS HVDC Transmission Line- 648 dampers were replaced.
- NSPML engaged EFLA Consultants to prepare designs for emergency replacement structures in 2019. Materials such as conductor, insulators, crossarms and composite poles required for contingency planning were ordered.
- Vegetation Management contract services were executed in both NL and NS.
- The planned vegetation management along the HVAC Transmission was completed in Q3, 2021 with approximately 247 hectares treated along TL269 (HVAC Line). Some minor work was completed in NS.

### Submarine and Land Cables

- Full survey of the Maritime Link cables was completed in Q4 2021. This survey inspected the 167km of each cable. There were no immediate concerns, further cable maintenance assessment work is in progress and will continue into the current year.
- NSPML continued to engage the Department of Fisheries and Oceans (DFO) and the groundfish industry representatives in NS and NL for purpose of promoting cable awareness and safety considerations.
- NSPML conducted study (with a consultant) to stay informed about changes to redfish quotas, timing of seasons, harvesting methodologies, and emerging fisheries in Cabot Strait.

## 5 O&M BUDGET

Breakdown of Forecasted O&M Costs in \$M	Operating Budget 2021	Costs Incurred to Dec. 31st, 2021	2022 Budget
Labour	3.5	3.9	3.5
General Administration	2.4	3.5	2.8
Maintenance Total (see Note)	8.6	9.5	8.9
Other	0.6	0.2	0.5
Insurance	3.0	3.1	3.8
Legal, regulatory & compliance	2.4	1.9	1.8
Contingency	1.0	0	0.3
<b>Total O&amp;M Budget</b>	<b>21.5</b>	<b>22.1</b>	<b>21.6</b>

**Note:** Maintenance Total includes HVDC & transition sites, AC substation, Marine, Overhead transmission lines and miscellaneous.

## 6 NSPML ORGANIZATION REVIEW

Over the course of 2021 the ML Project team continued to focus on Regulatory, Finance, and Project Closeout activities while providing ongoing corporate support to the Operations team. As of the year end, the Operations team composition remains similar to the previous year:

- A manager of HSSEQ was added to the team in 2021.
- Technical roles have been filled for HVDC Engineer for Woodbine and EIT in Halifax in 2021. Mentoring, training, and succession planning programs are in place.
- Temporary resources including On Site Representatives (OSRs), contractors and students were put in place to support the work.

## 7 CONCLUDING REMARKS

Suitable maintenance plans are in place or under development. Those plans will consist of an umbrella long term asset management plan as well as the equipment inventory, maintenance procedure documentation and work order systems. Performance reporting using CIGRE protocol is in place. Overhead transmission and grounding line repair contingency plans are in place.

For the time being the scheduled maintenance is conducted according to Original Equipment Manufacturer O&M manuals. Service Level Agreements are in place or are being finalized. This approach is deemed to be the most appropriate during the warranty periods and it is consistent with good utility practice.

Response to deficiencies and equipment failures has been timely and appropriate. Engineering solutions have been applied to transmission line hardware problems. Solution for de-rating HVDC for loss of transmission lines at Bottom Brook has been developed and the implementation of Special Protection System is expected in Q3 2022.



# LCP - ML PROJECT

## SITE VISIT REPORT JUNE 26 TO 30, 2022

Prepared for: Natural Resources Canada and NSP Maritime Link Inc. (NSPML)

IE Point of Contact: Nik Argirov

Date: July 29, 2022

### *Quality Assurance Statement*

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<b>Prepared by</b>	Nik Argirov, Vlad Kahle and Hamdy Khalil
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<b>Approved for Issue by</b>	Nik Argirov

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### *Disclaimer*

*This is a factual report issued for information only. The document contains information which may be confidential or proprietary. Any unauthorized use of the information contained herein is strictly prohibited and the writers shall not be liable for any use outside the intended and approved purpose.*

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## 1. GENERAL

Independent Engineer (IE) team participated in the Maritime Link (ML) project site visits. The site visits took place in the province of Newfoundland between 27<sup>th</sup> and 29<sup>th</sup> of June 2022. NSPML management representatives Craig Snelgrove, Rory MacNeill, Deon Hamlyn and Eric Cayouette led the site meetings and accompanied the IE team on their site visits. Norm Dimmell participated in several site visits and attended the Maritime Update meeting. Eric Cayouette assumed the responsibility for the itinerary.

IE team: Nik Argirov (IE Team Lead)

Vlad Kahle (IE Electrical SME)

Hamdy Khalil (IE Transmission Lines SME)

The trip itinerary was as follows:

June 26/ 27:

- Arrive and overnight in Deer Lake, NL

June 27:

- Cape Ray HDD site
- Cape Ray Transition Compound

June 28:

- Granite Canal switching station
- HVAC powerline aerial inspection

June 29:

- Bottom Brook Terminal 2
- Indian Head electrode site
- Maritime Link Update at BBR converter station

June 30:

- Travel from Deer Lake to home base

## 2. NEWFOUNDLAND PROJECT SITES VISITS – JUNE 27, 28 AND 29, 2022

Transportation to the sites was by road and helicopter.

### 2.1. Cape Ray Landfall Cable Site

The cable site and cable trench to the transition compound have been well maintained and were in perfect order. Grounds were restored. Adjacent to landfall HDD site Emera installed public look out and information display.



Photo 1: Cape Ray landfall HDD cables site

## 2.2. Cape Ray Transition Compound

The facility has been well maintained and is in perfect order. Cable temperature monitor is fully operational.



Photo 2: Cape Ray transition compound site

### 2.3. Granite Canal Switching Station and HVAC Line Aerial Inspection.

Helicopter transport was organized by Deon Hamlyn who together with IE conducted the AC line aerial inspection. Visual ground inspection of the Switching Station has shown the facility is in good order. Several dampers on the HVAC line have slid to the line midspan. Locations were recorded for future remedial action. There was no sign of conductor damage.



Photo 3: Granite Canal Switching Station



Photo 4: Granite Canal Switching Station



**Photo 5:** Aerial photo of the AC transmission line



**Photo 6:** Storage facility - Emergency spare FRP (Fiber reinforced) poles



**Photo 7:** Storage facility - Emergency spare materials



**Photo 8:** AC transmission line dead-end structure

#### **2.4. Bottom Brook Terminal Station 2 Site**

Tour of the switchyard and control room show the facility has been well maintained and is in good order.

#### **2.5. Indian Head Grounding Site**

The site has been fenced off to restrict public access. Several electrodes have been withdrawn and inspected for corrosion. The facility has been well maintained and is in good order. Electrode Line Fault Locator is functional, but it does not have the desired accuracy. Solution is being pursued.



**Photo 9:** Indian Head grounding site with the protective berm in good condition



**Photo 10:** Indian Head grounding line fault detector



### 3. MARITIME LINK UPDATE JUNE 29, 2022

#### a) Safety and Pandemic:

- One contractor had serious accident with an ATV at another Emera affiliate. ENL partnered with this Emera affiliate and developed competency program for the ATV operators. Four Quad bars that prevent the vehicle from flipping over were purchased and installed.
- Effective June 6<sup>th</sup> EMERA moved to pre- pandemic office protocols. Masking is now optional. For stations effective date was moved to June 15<sup>th</sup>.
- Three documents were uploaded.

#### b) Planned Maintenance Outages between June 6<sup>th</sup> and 14<sup>th</sup>:

- Pole 1 outage lasted 81 hours, Pole 2 101 hours.
- Necessary safety measures and observations were implemented, and no injuries were reported.

#### c) Forced Outages:

- On Feb 8<sup>th</sup> line differential protection initiated Pole 1 trip. Automatic restart was requested by NLSO, following morning inspection that found ice underneath the HVDC line.
- Valve cell capacitance monitoring trip function has been disabled due to several misoperations. Shielding did not address the anomaly, further investigations are planned by ABB. Alarm function remains operational. Equipment is monitored on daily basis.

#### d) Transmission Line:

- NL- ground inspections were completed on HVDC, HVAC and the ground line (GL). Minor findings only. Aerial and climbing inspections and vegetation management are planned.
- NS- HVDC inspection and vegetation management work planned for Q3 2022.
- Vegetation spraying is underway for HVDC Line.

#### e) Bottom, Brook Short Circuit:

- Addition of three Special Protection System (SPS) has been approved. This SPS is intended to reduce the probability of and severity of ML operating restrictions.
- Detailed design has been completed and the panels are being fabricated. Installation is planned for Q3 2022.

#### f) Diesel Generator Alternator Replacement and Commissioning Records Review:

- Alternators were replaced and re-commissioned at both Bottom Brook and Woodbine converter stations. Item closed.
- Apparent deficiency in original commissioning quality control necessitated review of the Project commissioning records by NSPML. Testing records for Breaker Failure protection initiation from the HVDC to AC stations were not yet found. If needed, the tests will be repeated.

#### g) Planned tests:

- ML- LIL runback re-testing .
- 475MW LIL Overload testing (Spring / Early summer 2022 ).
- 700MW LIL Overload testing (Fall 2022).





- 2 x 250MW thermal testing (August/September 2022).
  - 500MW Demonstration (at opportunity).
  - 500MW Test (2023).
- h) Marine Update:
- Assessment of 2021 marine survey results continues. Started the Cable Integrity Risk Assessment (CIRA) process with consultant for external threats (ice, fishing, anchor).
  - 2022 Survey Campaign Contract is being finalized; execution of survey work is anticipated in August. There is no outage requirement for this survey.
  - Kraken data acquisition of Maritime Link cable as part of Canada's Ocean Super Cluster Ocean Vision project has experienced further delays with AUV. 2022 completion of the program appears unlikely, and the work is anticipated to take place in 2023.
  - At this time, and subject to findings from 2022 survey, NSPML is not planning a "conventional" marine survey campaign in 2023 in addition to the Kraken campaign.
  - NSPML is not pursuing an IMR framework agreement with OEM for 2023, at this time.

## 4. IE COMMENTS

It is anticipated that the link will meet the expected performance criteria in 2022.