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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 Q1 2023**

**REDACTED  
(Attachments Only)**

**April 17, 2023**

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**Table of Contents**

1.0	Introduction.....	3
2.0	Update of Project Schedule.....	4
2.1	Gates and Milestones .....	4
2.2	Safety.....	4
2.3	Commercial Activities.....	4
2.3.1	Land Access Agreements.....	4
2.3.2	Funding.....	5
2.3.3	Joint Development Agreements.....	5
2.4	Engineering Activities.....	5
2.5	Submarine Cables.....	5
2.6	Converters and Substations .....	6
2.7	Transmission Lines .....	7
2.8	Independent Engineer.....	7
2.9	Status of Nalcor Project and Muskrat Falls.....	7
2.10	Status of Benefits to NS Power Customers.....	8
3.0	Updated Cost Summary .....	10
4.0	Cost Flow .....	12
5.0	Assessment Financial Update 2022 .....	13

1 **1.0 INTRODUCTION**

2  
3 This is the Q1 2023 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, outstanding expropriations, and outstanding operating  
18 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 M10812 and M10909 (NSPML's Q3 &  
26 Q4, 2022 Quarterly Reports), 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 are 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. NSPML continues to be risk-focused on the assessment of all work activities.  
17 There have been no recordable incidents to date in 2023.

18  
19 **2.3 Commercial Activities**

20  
21 All key major procurement initiatives are now closed.

22  
23 **2.3.1 Land Access Agreements**

24  
25 The majority of land rights are now in place. In NS, NSPML has moved to expropriation  
26 for 54 parcels of land as required where agreement could not be reached, landowners  
27 could not be found, or title to a land parcel was imperfect. NSPML continues to await  
28 final review and determination from the NS Government regarding these expropriations.  
29 These easements do not affect the ability of the project to complete contract closeouts  
30 or to operate according to plan. The Newfoundland & Labrador Government has  
31 formalized the expropriation panel, and related land matters in NL are currently with the

1 panel. All lands have been expropriated; however, there are some lands where owners  
2 could not be found where funds will be paid into trust, as well as a claim regarding  
3 mineral rights.

4  
5 **2.3.2 Funding**

6  
7 The final draw against the \$1.3 billion Federal Loan Guarantee was requested in  
8 February 2020.

9  
10 **2.3.3 Joint Development Agreements**

11  
12 The Regulation Service Agreement between NS Power and Nalcor (NLH) has  
13 progressed pending establishment of protocols for usage by NS Power. NLH has  
14 completed their filing with the NL PUB and there is now a tariff for regulation service  
15 in Newfoundland & Labrador. It is noted that presently operations are not constrained  
16 by this and there are no commercial needs for the agreement.

17  
18 The two remaining agreements are internal matters to Nalcor as they relate to the  
19 assignment by Nalcor of these agreements to an affiliate. Nalcor is not contractually  
20 required to assign the agreements to an affiliate. The status of these agreements does not  
21 impact the ability of the company to operate in fulfilment of its obligations. Please refer  
22 to Attachment 1 for a listing of the Agreements.

23  
24 **2.4 Engineering Activities**

25  
26 All engineering for the Project phase has been completed.

27  
28 **2.5 Submarine Cables**

29  
30 Please see Attachment 2 and Confidential Attachment 3 for the 2022 Survey Results  
31 Report that was completed in August 2022 and associated NSPML memo as requested

**NSPML Quarterly Report Q1 2023**  
**Redacted (Attachments Only)**

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1 by the Board (please refer to M09939). Additionally, please see Attachment 4 and  
2 Confidential Attachment 5 for the report of the nearshore subsea investigation of rock  
3 berms at HDD (Horizontal Directional Drilling) exit locations in Cape Ray and Point  
4 Aconi completed during October 2022, following storm Fiona, complete with NSPML  
5 memo.

6  
7 NSPML has filed a revision to its Submarine and Land Cable Maintenance and Repair  
8 Plan under M08318. This filing also responds to the Board's request for an update on  
9 any potential contingency support agreement(s).

10  
11 **2.6 Converters and Substations**

12  
13 The Converters and Substations have been in service since January 2018 and continue  
14 to perform well.

15  
16 Currently September 11-14, and September 14-17 are planned for monopole shutdown  
17 maintenance activities for the Maritime Link facilities. There is no bipole outage  
18 planned for 2023.

19  
20 On January 23, 2023 Maritime Link experienced a single pole forced outage. During  
21 restoration efforts, approximately 31,000 customers in Newfoundland were  
22 disconnected from the electrical system for several minutes. The cause(s) of the event  
23 is understood and has been rectified.

24  
25 As requested by the UARB in its letter regarding the Q3 & Q4 report from 2002, please  
26 refer to Confidential Attachment 6 for the investigative report describing the November  
27 14<sup>th</sup> outage of the Maritime Link and the associated rectification.

28  
29 Energy availability for the Maritime Link up until March 31, 2023 is 99.5% and  
30 monopole availability stands at 100%.

1 **2.7 Transmission Lines**

2  
3 The overhead transmission system continued to perform well into the fifth year of  
4 operations with no significant reliability or availability issues experienced. As  
5 requested by the UARB in its letter dated January 18, 2023 regarding the Quarterly  
6 Reports from Q3 & Q4, 2022, please see Attachment 7 and Confidential Attachment 8  
7 for a summary memo of the transmission line inspection details identified in 2022.

8  
9 **2.8 Independent Engineer**

10  
11 NSPML remains engaged with the Independent Engineer (IE) related to the Operations  
12 phase of the Maritime Link, as per the Federal Loan Guarantee requirements.

13  
14 The IE completed site visits of NSPML's assets in Cape Breton, NS, in November 2022.  
15 The IE's site visit report is provided in Attachment 9.

16  
17 **2.9 Status of Nalcor Project and Muskrat Falls**

18  
19 **Muskrat Falls Assets**

20  
21 All four units continue to operate (subject to planned maintenance activities) under  
22 control of the Newfoundland and Labrador System Operator ("NLSO").

23  
24 **Synchronous Condensers at Soldiers Pond**

25  
26 As requested previously by the UARB, NSPML will file the GE root cause analysis  
27 report for the SC1 outage once it becomes available. Two of three units were in service  
28 as of April 12, 2023.

1       **Labrador Island Link**

2  
3       Coordination between the Newfoundland, Nova Scotia, New Brunswick and New  
4       England system operators continues to ensure systems are ready and testing is  
5       coordinated.

6  
7       Significantly, the 700MW overload and heat run tests were successfully completed on  
8       April 6 and 8, 2023. These were significant and the final tests for NLH to achieve  
9       formal project commissioning per their Federal Loan Guarantee requirements. This  
10      milestone included a detailed review and independent assessment and sign-off by the  
11      Newfoundland and Labrador System Operator (NSLO), that the asset is now  
12      confirmed to be operating suitably to support reliable system operation and full  
13      functionality at 700MW. This was verified by the Independent Engineer through  
14      issuance of the LIL commissioning certificate on Friday, April 14<sup>th</sup>, 2023. As with the  
15      Maritime Link commission certificate received in 2018, there are a number of punch  
16      list items that will be addressed over the coming months.

17  
18   **2.10 Status of Benefits to NS Power Customers**

19  
20      Customer benefits received to date are being reported by NS Power with its Quarterly  
21      Fuel Adjustment Mechanism Report and otherwise in accordance with the Board's  
22      directions in Decision M10206.

23  
24      Since entering into the Acceleration Agreement with Nalcor Energy ("Nalcor") to  
25      commence delivery of the NS Block in August 2021, Nova Scotia customers have seen  
26      approximately \$300 million in quantifiable benefits from the Maritime Link ("ML"). As  
27      confirmed by NS Power's latest Q4 2022 Benefits Report filed with the Board, the ML  
28      delivered \$259,227,486 in quantifiable benefits over 2022 alone, comprised primarily of



**NSPML Quarterly Report Q1 2023**  
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1 base NS Block and Supplemental Energy deliveries.<sup>1</sup> When offset against the costs of the  
2 ML, Nova Scotia customers received net benefits of over \$98 million in 2022.<sup>2</sup>

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<sup>1</sup> Q4 Benefits Report, Appendix A

<sup>2</sup> Net benefits calculated based on the \$259 million in benefits less the \$168.4 million 2020 ML costs plus the \$8 million in hold back amounts that will not be released to NSPML; see NSPML's submission for the UARB Proceeding for the Holdback Mechanism Review (M11009), page 11, lines 18-25.

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 December 31, 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 December 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.

**NSPML Quarterly Report Q1 2023**  
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1 **Table 2 Updated Cost Summary for the Maritime Link Project**

(000's of Canadian Dollars)	Actual Costs						Estimate to Completion	Total Project Estimate at Completion (A)
Description	2011-2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Total Project to Date		
<b>Emera NL Project Management Costs</b>	197,078	(8,129)	276	76	(7)	189,294	5,811	195,105
<b>Nalcor Project Support Costs</b>	16,214	-	-	-	-	16,214	2	16,216
<b>Construction and Engineering Initiatives</b>	1,353,106	(12)	(1,448)	34	22	1,351,702	(59)	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	548,618	15	340	76	(7)	549,042	1,036	550,078
AC and DC Transmission	442,623	(27)	(1,788)	34	22	440,864	(1,098)	439,766
<b>Grand Total</b>	<b>1,566,398</b>	<b>(8,141)</b>	<b>(1,172)</b>	<b>110</b>	<b>15</b>	<b>1,557,209</b>	<b>5,754</b>	<b>1,563,033</b>

2  
3 *Note:* Net of recovery of costs from third parties relating to transmission warranty claims  
4 (\$1.8 million). A small amount of warranty claims to be recovered remains outstanding.

5  
6 **Total Actual Project Costs at end of Q4 2022 Compared to Previous Forecast**

7 As reflected in Table 2, the total actual project capital costs incurred during Q4 2022  
8 was \$14,610 primarily relating to legal costs incurred for project close out and land.

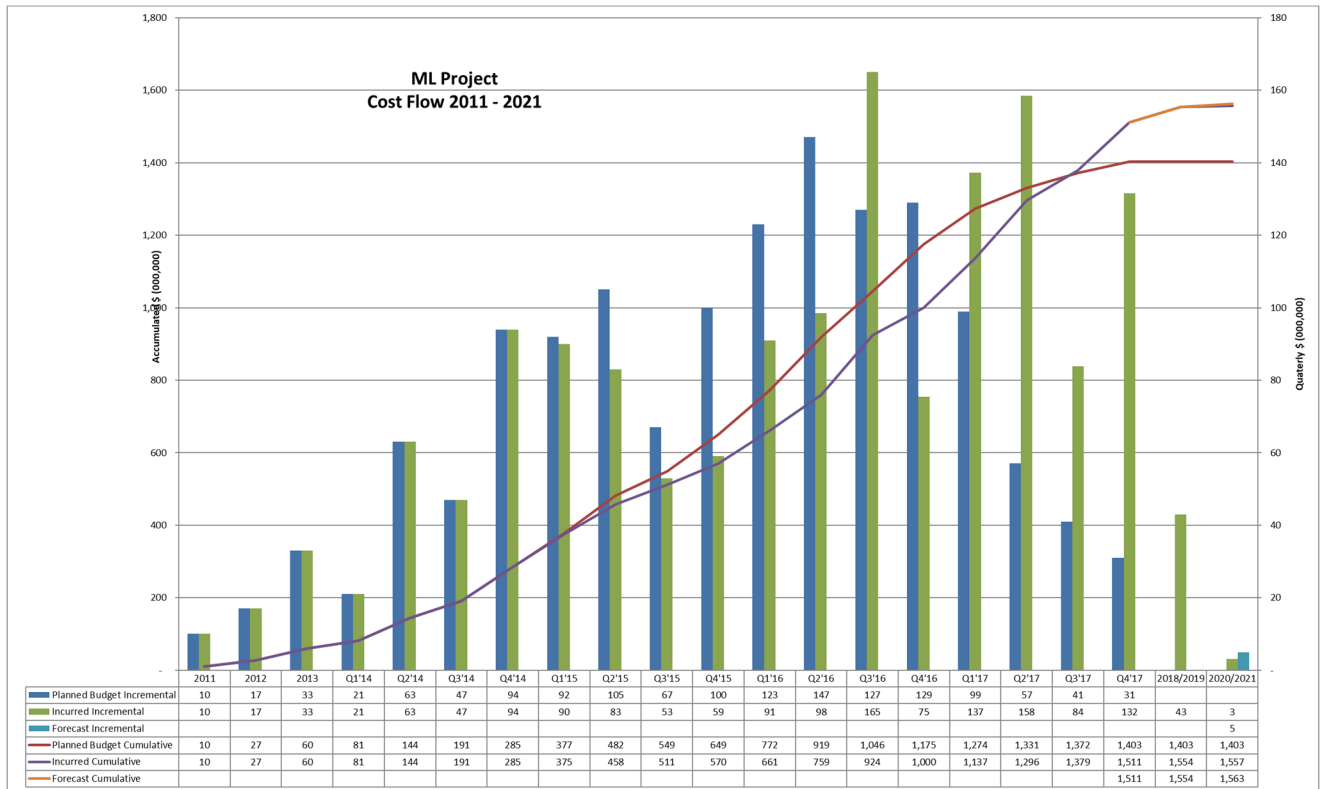
**NSPML Quarterly Report Q1 2023  
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**4.0 COST FLOW**

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**



**NSPML Quarterly Report Q1 2023**  
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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's 2022 operating, and maintenance costs were within the  
5 amount approved for the year.

6

7 With respect to the holdback mechanism, the threshold of 90% deliveries was not  
8 achieved fully in 2022. Accordingly, NS Power paid \$4 million of holdback revenues  
9 in 2022 for the months in which 90% or more of deliveries were achieved, \$14 million  
10 of holdback is under review as part of the ongoing holdback regulatory process.

**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	Tariff Regulation completed and in place. Commercial protocol will be established when required.
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	NSPI, NLH	Various matters relating to	IOA, Schedule C	Completed

	Operating Relationship		operating relationship		
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



# Memorandum

**Date**      **April 17, 2023**

**Subject: NSPML Summary of Maritime Link Cable Inspection 2022 Survey Results Report, prepared by Horizon Maritime and Seaforth Geosurveys Inc.**

## **Reference Documents:**

1. D-000OP-0-950-05-300    Survey Results Report - Cable Inspection Survey 2022 - Horizon Maritime Ltd

## **Introduction**

During the Summer of 2022, 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, along the full West and East cable routes between Newfoundland and Nova Scotia as well as general visual inspection information at two freespan locations. Using this data, the survey identified general geological conditions of the seafloor, seafloor disturbances along the cable route, as well as a high-level seabed surface comparison between the 2022 and 2021 surveys.

The 2022 data is compiled with previously collected survey data and feeds accordingly into NSPML's risk modelling. The 2021 survey data updated depth of burial measurements and along with results of the 2022 survey are key inputs to the continuing and ongoing assessment of corrective maintenance requirements.

## **Comments**

The 2022 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 that have no observable changes from previous year's survey. As previously mentioned, certain freespan in deepwater sections do not appear to be backfilling year-over-year. These are being assessed further for propensity for vibration under predicted ocean currents.

While survey results to date indicate there is no immediate remediation required, NSPML is currently evaluating the need for incremental protection for the interest areas noted above in consideration of the year-over-year protection status and trends as well as the overall Cable Integrity Risk Assessment (CIRA).

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

**Attachment 3 (Cable Inspection Survey) has been removed  
due to confidentiality.**



# Memorandum

**Date**      **April 17, 2023**

**Subject:**    **NSPML Summary of the 2022 Post Fiona HDD Inspection Survey Report,  
prepared by Seaforth Geosurveys Inc.**

## **Reference Documents:**

1. SGI-882    2022 Post Hurricane Fiona HDD Inspection Survey Multibeam Bathymetry and Sidescan Sonar – Survey Summary Report – Seaforth Geosurveys Inc.

## **Introduction**

During September 24<sup>th</sup> and 25<sup>th</sup> of 2022, storm Fiona passed over Cape Breton and the southwestern part of Newfoundland and Labrador in the vicinity of Port-Aux-Basques and Cape Ray.

Following the storm, NSPML contracted Seaforth Geosurveys Inc. to conduct a subsea investigation of the rock berms at Horizontal Directional Drill (HDD) exit locations at Cape Ray (NL) and Point Aconi (NS).

A 15-metre fishing vessel was mobilized with a pole mounted multibeam echosounder and a towed sidescan sonar. The survey collected information to identify if any cable exposures were present in the rock berms protecting the submarine cables. The post Fiona data collected was compared against the data collected in 2021 as well as data collected earlier in 2022 (pre-Fiona) to assess changes to the rock berms.

## **Comments**

Full details from this survey can be found in the confidential document referenced above<sup>1</sup>. There were no cable exposures noted as part of this investigation, however changes to protection were observed and NSPML is evaluating the need for incremental protection for these areas of interest.

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

---

<sup>1</sup> Please refer to Section 4.

**Attachment 5 (Maritime Link Nearshore Survey) has been removed due to confidentiality.**

**Attachment 6 (Maritime Link Outage) has been removed  
due to confidentiality.**



# Memorandum

**Date**      **April 17, 2023**

**Subject: NSPML Summary of 2022 Transmission Line Inspection Results**

As per NSPML's Q3, 2022 Quarterly Report, the 2022 Transmission line inspection of all lines in NL and NS has been completed, with no major issues being identified. As directed by the NS Utility and Review Board in its letter regarding M10812 & M10909, a summary of the details where issues were identified is attached as confidential Attachment 8 to this Quarterly Report.

During 2022 there were 549 inspections completed on the Maritime Link's transmission lines in Newfoundland and Nova Scotia. These were a combination of ground level, climbing and aerial inspections.

From these inspections there were 39 issues identified. Of these, 22 issues were addressed either during the inspection or shortly after if parts were required.

None of the items are significant, and NSPML anticipates the remaining issues, such as missing signage and damaged insulators to be addressed in the near future.

**Attachment 8 (Transmission Line Inspection Results) has been removed due to confidentiality.**

# LCP - ML PROJECT

## SITE VISIT REPORT NOVEMBER 7 TO 10, 2022

Prepared for Natural Resources Canada and Emera

IE Point of Contact: Nik Argirov

Date: December 9, 2022

### *Quality Assurance Statement*

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<b>Reviewed by</b>	Nik Argirov
<b>Approved for Issue by</b>	Nik Argirov

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## TABLE OF CONTENTS

1. GENERAL .....	1
2. MEETING WITH ENL– NOVEMBER 8, 2022.....	1
3. SITE VISITS- NOVEMBER 8 / 9, 2022.....	3
4. POST VISIT NOTE .....	7
5. COMMENTS .....	7

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## 1. GENERAL

Independent Engineer (IE) team participated in meeting with ENL managers and visited Nova Scotia Maritime Link (ML) sites. The site visits took place between November 7<sup>th</sup> and 10<sup>th</sup>, 2022. Emera management representatives led the ENL HQ and site meetings and accompanied the IE team listed below. Transportation to Cable Storage compound in Mulgrave, Woodbine site, Transition Compound and Grounding Site was by road.

IE team: Nik Argirov (IE Team Lead)

Vlad Kahle (IE Electrical SME)

Hamdy Khalil (IE Transmission Lines SME)

Trip itinerary:

November 7:

- Arrive and overnight in Halifax NS

November 8:

- Meeting at Emera's HQ, site visit at Mulgrave Port cable storage site and travel to Sydney

November 9:

- Meeting and site visit at Woodbine HVDC station, site visits at Big Lorraine and Point Aconi

November 10:

- Travel to home bases

## 2. MEETING WITH ENL– NOVEMBER 8, 2022

Purpose of the meeting was to provide a general update of maintenance and performance for the period since our last meeting in June 2022 as well as update on key initiatives and outline the maintenance plans for 2023.

Safety:

- Safety moment focused on snowblower operation.
- There were no reportable injuries during the reporting period.
- There has been conscious effort to engage the contractors in safety discussions that received positive response and produced useful feedback.

Environmental Update:

- There were no moderate or serious environmental incidents
- Fish passage was facilitated on private property adjacent to Grounding Line ROW.

Planned Maintenance Outage Work Activities:

- Transformer Testing
- Fire Protection Testing
- Valve Cooling Motors
- Minor corrective maintenance
- Pole 1
- Pole 2

NL HVDC Line:

- Aerial and climbing inspections were completed.
- Minor repairs were carried out.

NS HVDC Line:

- Aerial and climbing inspections were completed.
- Minor repairs were carried out.

NL HVAC Line Status:

- Climbing inspections and jumper replacements were completed.
- Saddle and insulator repairs were carried out.

Grounding Lines:

- Aerial and ground level inspections were completed.
- Tree removal took place following the windstorm, Fiona.

Vegetation Management:

- NL- work was completed.
- NS- work is scheduled for Q4, 2022.

TL Maintenance Safety:

- High Risk Review and hazard identification took place on location throughout the work program.
- Program was well received. Contractor participation recognition was implemented.
- Emera provided on site safety representatives.

Marine Update:

- Cable Integrity Risk Assessment is in progress to be completed by end of the year.
- Storm Fiona created significant damage on SW coast of NL, but no material damage was observed at the HDD sites.
- Significant infill of soft sediment was observed at Cape Ray subsea cable rock berm areas. No cable exposure was observed, further evaluation is pending.
- Ice sonar ULS was recovered.

Asset Management and Performance (as of end of Q3):

- Bipole availability was 93.32%.
- Pole 1 availability was 97.28%.
- Pole 2 availability was 96.03%.
- Monopole availability was 100%.
- Pole 1 DC line fault occurred on Sept. 24<sup>th</sup>. Restarted OK.
- Pole 2 valve hall emergency door interlock was detected, and it triggered valve group block on Sept. 14<sup>th</sup>. Door was not properly latched and flexed sufficiently to activate the 'open door' sensor. Further remedial work is pending.
- Bottom Brook SPS (Special Protection System) control cable availability delays necessitates deferral of installation work to new year. The installation is scheduled for Q1/Q2 2023.
- Remaining Breaker Failure testing at BBK is scheduled for Q1 2023.

2023 Maintenance Outlook:

- HVDC System Annual Planned Outage
  - Pole 1: September 11<sup>th</sup> to 14<sup>th</sup>.
  - Pole 2: September 14<sup>th</sup> to 17<sup>th</sup>.
  - 500MW Performance Measurement Tests TBD.

- Subsea Cable
  - No currently planned outage in 2023.
- Transmission and Grounding Lines
  - Possibility of TL269 outage to facilitate minor corrective work in August 2023.
  - Ground Level Inspections Q1/Q2, 2023.
  - Vegetation Management and Climbing Inspections Q3/Q4, 2023.
- AC Substations
  - No planned transformer or bus outages.
  - Nominal inspection and maintenance plan execution by NLH and NSPI.

#### Marine 2023 Plan:

- Marine Inspection Surveys
  - Kraken data acquisition of Maritime Link cable, as part of Canada's Ocean Super Cluster Ocean Vision project, is anticipated to take place in 2023.
  - At this time, and subject to assessment of 2022 surveys, NSPML is not planning a "conventional" marine survey campaign in 2023 in addition to the Kraken campaign.
- Cable Protection Plan
  - Finalization of the Cable Integrity Risk Assessment report in 2022 and assessment from 2022 surveys will feed into a cable protection needs assessment
- Inspection, Maintenance, Repair Framework
  - Repair preparedness activities will continue in 2023.

### **3. SITE VISITS- NOVEMBER 8 / 9, 2022**

#### 3.1 Canso Superport

- Viewed storage facility of spare cable length earmarked for cable repairs and splicing.

#### 3.2 Woodbine Converter Station

- Observed the morning Operations meeting. Roundtable and updates took place via audio/ video links to Emera HQ and Bottom Brook.
- Group visited the switchyard, converter building and spare parts storage facility. Sites have been fully reclaimed, construction material was removed, and the station appears to be in good order.





### 3.3 Big Lorraine Grounding Site

Site has been fully reclaimed, construction material was removed, and the station appears to be in good order.







### 3.4 Point Aconi Transition Compound

Site has been fully reclaimed, construction material was removed, and the station appears to be in good order.



## 4. POST VISIT NOTE

IE were advised that forced outage of Maritime Link occurred on November 14, 2022. At Bottom Brook, Pole 2 converter transformer load tap changer (LTC) was automatically locked out due to failed resistive temperature device (RTD) and Pole 2 was unable to control the converter current flow. The Operator attempted manual correction that had no effect due to Pole 1 underfrequency control and Pole 2 over-modulation. Resulting interaction between the Pole 1 and Pole 2 controls necessitated manual Pole 2 and then Pole 1 trip at Woodbine. The swing in ML power on Pole 2 depressed Newfoundland system frequency and voltage that initiated underfrequency load shedding and significant loss of customers loads most of which was quickly restored.

### Remedial Action:

- Replace the Pole 2 Converter Transformer Tap Changer Temperature Transducer and RTD.
- Implement a software revision order; RO-317 which will allow a Bottom Brook tap changer lockout to stop all ongoing ramping and prevent overmodulation of the converter.
- Inspect all Maritime Link Converter Transformer tap changer temperature transducers to ensure functionality and error codes.

### Long Term Strategy:

- Review and propose modifications to HVDC protection subsystems aimed to prevent the converter from entering undesired zones of operation.
- Monitor and supervise the tap changer temperature in the HVDC Control and Protection System and alarm upon tap changer high temperature. Consider using the HVDC Control and Protection system to directly trip the tap changer motor operator upon high temperature.
- Preparation of a detailed Root Cause Analysis (RCA)

## 5. COMMENTS

All sites appear to be in order and are fully operational. Planned maintenance has been carried out, no safety or environmental issues have been reported to the IE. 2023 Maintenance Plan is in place.

Minor corrective maintenance tasks have been completed or are in the planning stages. Two HVDC forced outages occurred in September, both were duly investigated, and their outage cause was identified. HVDC performance report at end of Q3 indicates monopole availability of 100% and Bi- pole availability of 93.32%.