newfoundland labrador hydro
a nalcor energy company

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March 30, 2021

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary

Dear Ms. Blundon:

Re: Reliability and Resource Adequacy Study Review – Labrador-Island Link Monthly Update – March 2021 – Board Questions – Hydro's Response

On March 9, 2021, the Board of Commissioners of Public Utilities ("Board") requested follow-up information related to the Labrador-Island Link ("LIL') Monthly Update filed by Newfoundland and Labrador Hydro on March 4, 2021. Enclosed please find the additional information provided by Nalcor Energy with respect to the Board's request.

1. **With regard to the February, 2021 events causing pole, electrode line, and berm damage, please:**

   a. **Confirm whether or not Nalcor/Hydro plan to determine the return period of these events that caused damage in these three areas. If yes, provide an estimated date when such return period determinations will be available.**

      Response:

      It is confirmed. The failure investigation being completed will evaluate the storm characteristics and line performance to determine an estimate of the return period for these events. Data from the event will be compared to the CSA 60826-10 standard's return period values for comparison purposes. Furthermore, specific weather modelling is being completed for the region to provide the team with further probabilistic values to consider outside the CSA Standard. This modeling is expected to be finalized and incorporated into the failure investigation report, which is expected to be available by mid Q2 of 2021.

   b. **Provide a detailed comparison of actual conditions during the events with the as-designed worst-case assumptions.**

      Response:

      The failure investigation will contain a complete detailed review of the as-built line's design condition to the conditions experienced during the event. The failure investigation report is expected to be complete by mid Q2 of 2021.

c. Identify the return periods to which Nalcor believed it designed the facilities affected by each of the three events and their locations at the time of design.

Response:

The damage sustained to the electrode conductor system is all comprised within the same meteorological loading zone for the LIL. This section is designed for events above a 1:150 year return period with respect to the CSA 60826-10 Standard.

d. Section 2.1.1, second paragraph, line 6/7, states that "while repairs to the Pole 2 conductor and Electrode Line 1 were ongoing", however there was no mention of any damage to Electrode Line 1 in the preceding text. State when this damage occurred and what repairs were necessary.

Response:

Details on the damage to Electrode Line 1 were provided in correspondence to the Board on February 15, 2021; for ease of reference, the correspondence is included as Attachment 1.

e. Summarize investigative activities completed and the nature and expected completion dates for remaining activities and provide management's best estimate of the date for completing investigations into the causes of each occurrence.

Response:

The detailed Failure Investigation is underway and expected to be concluded in Q2 of 2021. It includes the following activities:

- Summarizing locations of damage and evaluating failure patterns;
- Ice Event Information – recorded site observations/icing measurements from site, collecting Environment Canada information, detailed modeling of storm and segment conditions to evaluate the return period of the segment;
- Review of construction quality documentation and site observations of construction quality;
- Failure calculations for conductor slippage and cross arm capacity;
- Finite element modelling of cross arm;
- PLS-CADD transmission line modeling of LIL's as built condition considering the loading seen during the icing conditions;
- Material testing and results; and
- Formulating conclusion and recommendations for considerations.

f. Identify outside firms/resources engaged in such investigations and their roles.

Response:

The following firms have been engage to aid in the failure investigation:

- EFLA Consulting Engineers and KVT (Kjeller Vindteknikk) – Engineering Consultation and Weather Modelling;
- Kinetrics Inc. – Material Testing;
- Acuren Inc. – Material Testing; and
- Maskwa High Voltage – Third Party Reviewer.

g. List and describe remedial actions already undertaken or committed to be undertaken.

Response:

To date, all of the critical damage that would affect the power transfer capabilities of the LIL has been addressed. This damage ranged in severity from multiple broken electrode conductor strands to failed cross arms, broken electrode conductors, and broken pole conductor dead-end hardware. To date, the 11 damaged cross arms have been replaced. All 36 spans having significant conductor damage or failure have been repaired, with less serious damage planned to be repaired this summer.

There was also some damage identified on dampers, arcing horns, optical ground wire ("OPGW") components. Any towers where crews fixed more severe issues, they also addressed any additional issues observed.

Helicopter, ground patrols and localized drone patrols by Power Supply have identified some additional less severe issues, to be addressed in the upcoming maintenance season. This would include repairs to suspension clamps on the OPGW, replacement of damaged vibration dampers, addition of air flow spoilers on select line segments and the addition of safety chains to structures that experienced turnbuckle failures. In addition, a detailed drone inspection of the Labrador portion of the LIL is planned in the spring of 2021 to ensure all issues are identified. A further update will be provided once the full scope of work activities are known.

h. Describe how Hydro/Nalcor initially identified the abnormal conditions that followed the events.

Response:

On January 6–8, 2021, a significant ice storm passed through Labrador. On January 11, 2021, Power Supply line workers stationed in Happy Valley-Goose Bay, while enroute to southern Labrador for maintenance work, observed an abnormality with the electrode line near structure 318, where the line is close to the Trans-Labrador Highway. At this time there were no alarms or trips of the line, which had been operating in metallic return (without the use of the electrode line). Upon further inspection from their ATV, the line workers identified a failed electrode line cross arm at Tower 340 (approximately 120 km south of Muskrat Falls). The conductor at this location was still aloft and secure, however a portion of the cross arm was damaged.

i. Describe the methods and time to complete them to determine the locations affected by each event.

Response:

There were several methods utilized to identify abnormal conditions on the lines including helicopters, ground patrols, and drone inspections. The primary source for inspection was helicopter patrols. Upon discovery of the damage, Nalcor's focus was on repairs to the line and investigation for further potential damage. From a standard time frames perspective, it takes approximately six hours to conduct a round trip line inspection from Muskrat Falls to Forteau. This allows for identification of large and medium failures, however, some of the minor defects can be difficult to identify from helicopter. Ground patrols from snowmobile were utilized when helicopters could not fly due to weather. Crews can cover approximately 150 kilometres per day which would be approximately 400 structures. This method allows for identification of large to medium issues. The nature of many of the abnormalities during this icing event was very difficult to identify from helicopter and near impossible from the ground. The third method utilized was drone inspections, which were conducted by Power Supply personnel. Drone inspections were concentrated in two areas, one region approximately 125 kilometres south of Muskrat Falls and another 185 kilometres south of Muskrat Falls, where the majority of the damage occurred. The drone inspections are the slowest method of inspection as approximately 15 kilometres per day or 40 structures per day can be inspected. However, this method allows for detailed up close pictures that were reviewed by engineering and proved the best way to identify some of the minor damages that were not identified by ground or helicopter patrols.

It should be noted that, as this line was not required for serving Island load at the time, and given that it was often in service during some work or in service overnight, the level of urgency was not paramount. It was as well considered an invaluable process to improve shortcomings and thus response in possible future scenarios.

It should be noted that ice on the lines did hide many of the conditions on the lines in the early days of the repairs. Nalcor is preparing to conduct a drone inspection of the entire Labrador line in the spring of 2021 using a third party.

j. Provide maps indicating location of facilities affected by each event.

Response:

Maps are provided in the attached slide deck (see Attachment 2).

k. Describe use of helicopters in event diagnosis, response, and repair, and describe any barriers that limited such use.

Response:

Helicopters were primarily utilized to conduct inspections for anomalies and for ice removal. Poor weather early in the repair window limited the ability to conduct a full inspection of the line for several days. In addition, throughout the repair window, there would have been multiple days where repairs via helicopter would not have been possible due to weather conditions.

Based on the distance from Happy Valley-Goose Bay to the work sites and the daylight flying hours, a determination was made that wrench time would be highest by having the crews drive to site versus having them flown to site via helicopter.

Based on the snow depths, daylight flying hours, weather conditions and the nature of the repairs that were required on the LIL during this icing event, clearing the roads to utilize cranes for repairs was the preferred approach. Stringing conductor across multiple sections of towers required the use of heavy equipment to pull conductor through the travellers during the stringing process. Helicopters and experienced pilots are not readily available to complete such work. Such application of helicopters are used during significant line construction. Given the icing that was on the lines and towers, the crews determined the safest approach was to utilize heavy equipment as back stays, and this required getting equipment to the site.

l. Identify for each affected location the number of days required to remove snow to gain access with required ground equipment to commence repairs.

Response:

There were essentially three areas of damage. The first area was along the Trans-Labrador Highway in the Structures S340 to S370 range, which spans approximately 15 kilometres and approximately 125 kilometres from Muskrat Falls.

The second area of damage was located approximately 49 kilometres off the Trans-Labrador Highway in the S516 to S530 range, which spans approximately 4.5 kilometres and approximately 185 kilometres from Muskrat Falls.

The third area was located approximately 12 kilometres off the Trans-Labrador Highway in the S1209 to S1229 range, which spans approximately 6.5 kilometres and approximately 28 kilometres by road from Froteau in southern Labrador.

Initials repairs were completed without the requirement for snow clearing. Upon discovery of further damage than that originally thought, snow clearing operations were initiated. Snow clearing began on January 17, 2021, and progressed to tower S529 on January 27, 2021. There were a number of factors that led to this duration, including:

- snow clearing was originally focused on the 300 series of towers;
- the scope of snow clearing at the 500 series towers increased from what was originally anticipated to be required;
- snow clearing equipment provided by Nalcor's contractor was initially also being used for Trans-Labrador Highway snow clearing (due to Nalcor and the Department of Works, Services and Transportation having a common contractor), and 24-hour a day resources were not originally requested; and
- initial use of tracked equipment to get to distant sites was a challenge due to snow conditions and increased the necessity of plowing and maintaining open roads until repairs in an area was completed.

Based on the learnings from this recent event, adjustments to equipment type and deployment have been identified to shorten response times in the future. It would be anticipated it would

take two days to mobilize the appropriate equipment and resources, and snow clearing could occur at an approximate rate of 20 km a day with similar snow conditions, provided no equipment issues and public highways remain open.

m. Provide the number of days from identification of abnormal conditions to gain access, initiate, and complete repairs (estimates of completion for any repairs remaining).

Response:

Please refer to response 1.(l) for information on site access timing. Repairs commenced the day following identification and continued through to February 24, 2021, at which time the majority of critical repairs were complete. This included several lost days due to weather, Trans-Labrador Highway closure as well as a safety stand down of seven days post a near miss with falling ice.

During this event, a crew was typically getting one splice completed each day due to a number of factors affecting the repair time. These factors affecting the repair time include, but are not limited to, weather (wind, snow, freezing rain, and temperature), tools and equipment issues, localized ice removal to create a safe work zone, installation and removal of personal protective grounds to allow power transfer during evenings. With none of the prior issues observed, a crew could complete a conductor spice in approximately four hours. Stringing electrode conductor from mid-span S515/516 to S524 took approximately five days. Again, there were delays due to the issues noted above. At each of S1209 and 1229, it took approximately two days to get the pole conductor back in the air and replace the broken components once the required tools and personnel were on site.

The scope of the remaining work activities is still being developed as described earlier, and the time to execute such will be determined based on that and input from the resources that will be used to execute these activities.

n. Describe how, assuming the LIL was in full-rated load bipole operation, each event would have affected full-load LIL operation.

Response:

Single Electrode Cross Arm Failure – It is not expected it to have an effect on full load bipole power transfer capabilities (900 MW) of the LIL.

Single Electrode Conductor Break – It is not expected to have an effect on full load bipole power transfer capabilities (900 MW) of the LIL.

Single Pole Conductor Break – This would result in the LIL operating in Monopole Earth Return. The power transfer capabilities would be 675 MW.

Double Electrode Conductor Break (EL1 & EL2 Breaks) – This would result in the LIL operating in Metallic Return. The power transfer capabilities would be 450 MW.

Single Pole Conductor and Single Electrode Conductor Break – This would result in the LIL operating in Monopole Earth Return. The power transfer capabilities would range from 446 MW to 674 MW depending on ambient temperatures.

Single Pole Conductor and Double Electrode Conductor Breaker (EL1 & EL2) – This would result in the LIL being offline.

o. EFLA's April 30, 2020 Reliability and Resource Adequacy Review (pages 52 and 55), indicated the LIL has no anti-galloping devices. Did galloping contribute materially to the bolt breakage that led to the conductor fall?

Response:

From initial inspection it is speculated that galloping is a contributing factor to the turnbuckle bolt breakage. On-going material testing will confirm the nature of the failure of the bolt breakage. We will have more information once the failure investigation is completed in Q2 of 2021.

p. State whether Hydro/Nalcor are aware of any previous conductor galloping conditions.

Response:

Conductor galloping has been observed on the LIL throughout construction and into operations. Conductor galloping is an unsystematic phenomenon that occurs when a variety of conditions are present such as ice accretion, specific wind direction and specific wind speeds over certain terrains. The galloping observed and recorded to date on sections of LIL has not been categorized as common to specific span locations or severe enough in nature to have caused damage to attachment points. Futhermore, climbing inspections to date have not identified damage or wear to towers or attachment points from galloping.

q. Describe plans for identifying where anti-galloping devices should be placed, and schedules for installing them.

Response:

Further inspection and monitoring is required to identify any other problematic locations for conductor galloping outside of this location. Galloping is an unsystematic phenomenon that occurs when variety of conditions are present such as ice accretion, specific wind direction and specific wind speeds over certain terrain. Engineering has studied a variety of different anti-galloping devices for LIL, including detuning pendulums, phase spacers and air flow spoilers. The utility has found the use of air flow spoilers to be successful in possibly reducing galloping events on lines, while not inducing worse galloping conditions as compared to the other devices. Air flow spoilers are also readily available from suppliers for the conductor sizes of LIL. The completed failure investigations will help determine the full cause of the pole conductor assembly failures. Since it is speculated that galloping is a contributing factor to the failure, plans are underway to place air flow spoilers in the location of the damage to pole conductor in 2021.

2. With respect to the replacement beams, please:

a. Describe the acceptance testing of the beams to be performed before the shipment to site.

Response:

General Electric ("GE") has a set of specifications and requirements that Von Roll must meet, as the beams were not included in the Lower Churchill Project ("LCP") specification. GE has a representative, as does LCP, to do periodic inspections at the Von Roll facility. Before shipping to site, Von Roll and GE will confirm that the final beams meet the specifications through materials, mechanical, dimension, and Insulation Resistivity testing.

b. Assuming that the first batch of beams will be sent to site after completion of tests, provide the expected dates/durations of shipping for the beams required for each pole.

Response:

The beams for the first pole are currently planned to be complete by end of April 2021. These beams are planned to be shipped in two batches; the first batch is to be shipped in mid April and the second batch the beginning of May. Beams for the second pole are scheduled to be complete in May 2021; these are also planned to be shipped in two batches at the end of May. GE has not provided the mode or duration of shipping at this point. Both air and/or cargo ship is being considered within the current schedule. The beams are not considered to be in the critical path.

c. Describe tests to be performed on the beams: (i) after arrival at site, and (ii) after installation of the beams.

Response:

GE will perform visual spot checks and insulation resistivity checks.

d. Provide the dates/durations for beam replacement for each pole.

Response:

GE is currently scheduled to start beam replacement activities for Pole 2 on May 1 and is planned to take approximately five weeks to complete. Beam replacement for Pole 1 is currently scheduled to start on June 1 and is planned to take approximately four weeks to complete.

e. Describe plans for dispatch of the beams in the event of failures of trial operations (e.g., will dispatch be delayed; where/how will they be stored pending commencement of replacement, do any material storage conditions apply?).

Response:

To ensure there are no material shortages at site, shipping of the beams would not be held back in the event of any delays to the completion of Trial Operations. If they need to be stored, they will remain in their original shipping packaging (e.g. sea cans, pallets, etc.) There are no specific storage requirements above and beyond what is applied during shipment.

f. Detail the preliminary plan for the final valve hall remediation work, including human resources, lifts, and cranes to be used, and expected time to completion of erection.

Response:

GE is working to finalize their methodology and procedures, which are based on their experience with the interim beam replacement. GE is looking to optimize their final plan to increase beam replacements per day. This exercise also includes a review of tooling, logistics, and human resources.

g. Describe all tests to be performed before the valves will be energized and after completion.

Response:

GE will perform fiber reconnection tests, module and valve cooling tests, and visual and Insulation Resistivity tests.

3. With respect to the synchronous condensers, please:

a. State whether the decision for GE to proceed with the elliptical bearing approach forecloses the option of making modifications to the foundations. If not, explain how/what conditions will be monitored to revisit any foundation modification need.

Response:

Decision to proceed with elliptical bearing does not preclude the possibility of future modifications to the foundation. Performance and vibration of the units will be monitored during operations, and if deemed necessary, Nalcor may at any time choose to remediate foundations if it believes that is necessary.

b. Identify measures that will be implemented to monitor the effectiveness of the elliptical bearing solution.

Response:

Vibration monitoring equipment will be installed on all three units for long term vibration monitoring and trending. Warranty inspection is recommended at 40,000 operating hours. Performance will dictate if an inspection is required prior to this.

c. Describe GE's responsibility should unacceptable vibrations appear within 5, 10 or 20 years, or expected equipment lifetime.

Response:

GE's warranty obligations under the current contract include a three year general warranty on each unit, as well as a 40,000 operating hour warranty on the rotor rim and flywheel.

d. State when Nalcor expects full operation of SC 3.

Response:

Full operation of SC3 is expected in May 2021.

e. Describe and quantify the risks, if any, of the impact to August 2021 completion from the decision to modify all bearings to the elliptical design.

Response:

Current schedule based on the elliptical bearing approach is completion of SC3 in May 2021, SC2 in July 2021, and SC1 in September 2021.

4. With respect to generating Unit 1, please:

a. Provide a range of modification completion durations reflecting management's views of the risks/uncertainties involved.

Response:

Based on experience from Unit 2, where the head cover modification has been undertaken, it is expected that work on Unit 1 will take approximately two to four weeks.

Andritz has not provided the results of its review of the welds on the Unit 1 inner and intermediate head cover welds, but 20 welds required rework on Unit 2. If Unit 1 has the same rework rate, this would require three to four weeks to complete.

In total, the modification program is expected to require five to eight weeks to complete.

Andritz also completed a fracture mechanics analysis of welds on the discharge ring on Unit 1. Inspection and rectification of these welds has already been completed by Andritz on a priority basis, as the results of the analysis indicated the potential for a crack to propagate in discharge ring welds under normal operating conditions, unlike the head cover welds where propagation is only a consideration under overspeed or speed-no load conditions.

b. State whether the modifications to the bolts between the inner and intermediate head covers have been implemented on Unit 1.

Response:

The bolt modifications have not been implemented on Unit 1. The head cover issue was first identified during testing on Unit 2 after Unit 1 was placed in service.

c. Noting that head cover joint modification and weld inspection/rectification will be undertaken on Units 1, 3 and 4 and that Unit 1 is already in commercial service and may be at risk of damage, describe plans and likely outage durations for Unit 1 inspection and correction.

Response:

As indicated in the response to 4.(a), the risk for damage is limited to operation under speed-no load or overspeed conditions. Andritz has advised that continued operation within the unit's normal power range does not present a risk of damage.

Andritz has recommended monthly inspections of the head cover and immediate inspection after a unit overspeed event. Inspections in February and March have revealed no issues with the Unit 1 head cover.

The monthly inspection requires approximately one day.

Please see the response to 4.(a) for an estimate of the duration of the head cover modification and weld rectification. A schedule has not been established for this work, but it is likely that it will be coordinated with downtime to undertake a required stator bar replacement in Unit 1.

5. With respect to the Muskrat Falls overall schedule, please:

a. Explain the particulars (nature, extent, and resulting schedule risk) behind the observation in Section 4.0, first paragraph, lines 4-5 that "schedule slippage for the Final Bipole Software remains high."

Response:

As per the LCP Risk Management Matrix, a schedule delay of one to three months beyond the 2020 Authorization for Expenditure ("AFE") schedule rebaseline is classified as high. The one to three month potential schedule risk is based on LCP's assessment of GE's actual progress against planned progress.

b. Given LCP management concerns about ongoing GE schedule slippage and GE's historical performance, describe in detail the basis for the LCP management's scheduling of final software delivery to the site on the date forecast by GE.

Response:

LCP's forecast is reflective of the current information. While LCP's current forecast for software delivery date is aligned with GE's forecast for delivery, LCP's forecast for bipole completion includes contingency in the commissioning duration as compared to GE's commissioning duration.

c. Describe and quantify (likelihood and length of extension) LCP management's assessment of the risk of delay in such delivery.

Response:

See response to 5.(a) and (d).

d. With LCP management scheduling completion of commissioning for later than GE forecasts, describe LCP management's view of the realism of this date and its assessment of the risk (likelihood and length of extension) of delay.

Response:

LCP's forecast is reflective of the current information available. As per LCP's risk assessment noted above, a one to three month delay against the AFE baseline schedule of September 30, 2021 is high, which could range from October to December 2021. The current forecast reflects that this risk is now materializing with the recent forecast schedule slip to November 15, 2021, which represents a forecast six week delay compared to the September 2021 completion date in the AFE baseline schedule. Further schedule slippage beyond the current November 15, 2021 forecast remains high as noted above.

Should you have any questions, please contact the undersigned.

If you have any questions or comments, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO

Michael S. Ladha
Vice President, General Counsel, Corporate Secretary & Commercial
MSL/sk

Encl.

ecc: **Board of Commissioners of Public Utilities**
Jacqui Glynn
Maureen P. Greene, Q.C.
PUB Official Email

Newfoundland Power
Gerard M. Hayes
Kelly C. Hopkins
Regulatory Email

Consumer Advocate
Dennis M. Browne, Q.C., Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
Sarah G. Fitzgerald, Browne Fitzgerald Morgan & Avis
Bernice Bailey, Browne Fitzgerald Morgan & Avis

Industrial Customer Group
Paul L. Coxworthy, Stewart McKelvey
Denis J. Fleming, Cox & Palmer
Dean A. Porter, Poole Althouse

Labrador Interconnected Group
Senwung Luk, Olthuis Kleer Townshend LLP
Julia Brown, Olthuis Kleer Townshend LLP

Attachment 1

Reliability and Resource Adequacy Study Review – Labrador-Island Link Monthly Update – January 2021 Further Update

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February 15, 2021

Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director of Corporate Services & Board Secretary

Dear Ms. Blundon,

Re: *Reliability and Resource Adequacy Study Review* – Labrador-Island Link Monthly Update – January 2021 Further Update

As follow-up to Hydro's February 4, 2021 correspondence, the status of a number of the reporting items has changed as outlined in the following.

1.0 COVID-19 PANDEMIC EFFECTS ON MUSKRAT FALLS PROJECT EXECUTION

On February 12, 2021, the Chief Medial Officer of Health announced that the recent rise in COVID-19 cases in the province is due to the COVID-19 UK variant, B.1.1.7, and as a result has moved the province to Alert Level 5. On February 13, 2021, the Lower Churchill Project ("LCP") issued a declaration of Force Majeure to GE Grid and GE Power for the Soldiers Pond Site for a period of two weeks as a precautionary measure in alignment with the Newfoundland and Labrador Public Health special measures order. The situation will be re-evaluated towards the end of the two week period, or earlier, if conditions merit.

2.0 LABRADOR-ISLAND LINK

2.1 Operations

The February 4, 2021, Labrador-Island Link ("LIL") update noted that damage to the electrode line in Labrador was isolated to eight of 1,229 towers, which included eight damaged crossarms, and 16 areas of electrode line conductor damage that required repair, including one span where the conductor was broken and laying on the ground. It was also noted that the majority of the damage was isolated to the electrode line, predominately, electrode line one (EL1), with minor damage to electrode line two (EL2). Since that update, additional damage has occurred on EL1 and EL2. Currently, damage has been identified on 30 of 1,229 towers, which includes 29 spans that require conductor splicing, repair, or restringing, including four spans where the conductor has fallen to the ground, as well as 12 crossarms that require repair or replacement.

Power Supply is continuing to leverage resources from its Emergency Response Plans to complete the repairs. As of February 14, 2021, 10 crossarms and 14 electrode conductor sections have been repaired. To date, all required material has been readily available from inventory. While the scope of the damage

to the electrode line has grown since the previous update, the current repairs are still planned to be completed in February 2021.

As noted in the February 4, 2021 update, on the night of February 3, 2021, during bipole dynamic commissioning, the LIL experienced an unplanned trip on Pole 2. Upon investigation, crews near Forteau discovered that a section of the Pole 2 conductor had fallen to the ground (this failure is separate from the ice storm damage to the electrode line). The cause of the failure has been identified as a failed eyebolt that secures the insulator to the dead end tower. Since this incident, a second Pole 2 eyebolt on a dead end tower in the same vicinity has been identified to have a similar failure mechanism. A contract resource has been mobilized to execute this repair in parallel with the electrode line repairs. Further inspections of similar hardware in this area are planned, and root cause investigations into the failures on both the Pole 2 conductor and the electrode line are underway.

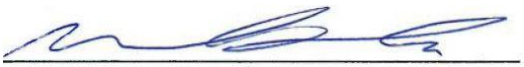
On February 7, 2021, while crews were repairing a section of conductor on EL1, a section of conductor on EL2 failed in the same vicinity resulting in notable shaking of the nearby towers and associated lines, which caused ice to fall in the vicinity of workers below. As a result of the safety incident, work activities were paused while the safe work plans were reviewed. A third party with experience removing ice from transmission lines has since been engaged to reduce the ice loading on the lines in order to minimize the risk of working on the repairs. Ice removal is expected to be complete on February 16, 2021.Once the ice has been largely removed, a detailed line inspection is planned to determine if further repairs will be required now or during the summer work season.

Dynamic commissioning and power transfer over the LIL has been paused since the EL2 failure on February 7, 2021. Dynamic commissioning will recommence once repairs are complete.

If you have any questions or comments, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



Michael S. Ladha
Vice President, General Counsel, Corporate Secretary & Commercial
MSL/sk

ecc: **Board of Commissioners of Public Utilities**
Jacqui Glynn
Maureen P. Greene, Q.C.
PUB Official Email

Newfoundland Power
Gerard M. Hayes
Kelly C. Hopkins
Regulatory Email

Consumer Advocate
Dennis M. Browne, Q.C., Browne Fitzgerald Morgan & Avis
Stephen F. Fitzgerald, Browne Fitzgerald Morgan & Avis
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Senwung Luk, Olthuis Kleer Townshend LLP
Julia Brown, Olthuis Kleer Townshend LLP

Attachment 2

TL3501/2 Damage – January Ice Storm, 2021

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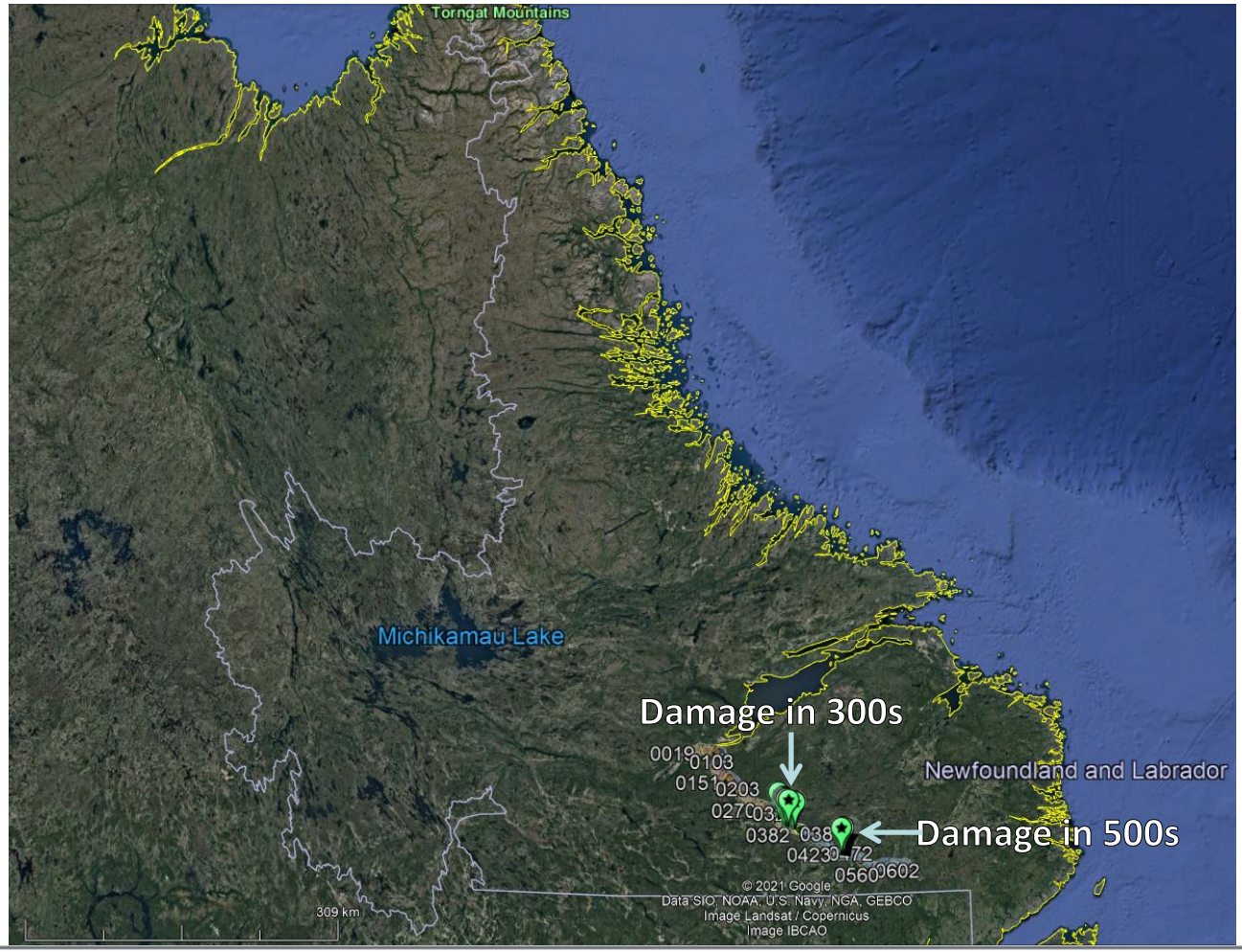
TL3501/2 Damage

January Ice Storm, 2021

nalcor energy
LOWER CHURCHILL PROJECT

Attachment 2

Labrador


Torngat Mountains
Michikamau Lake
Damage in 300s
Damage in 500s
Newfoundland and Labrador
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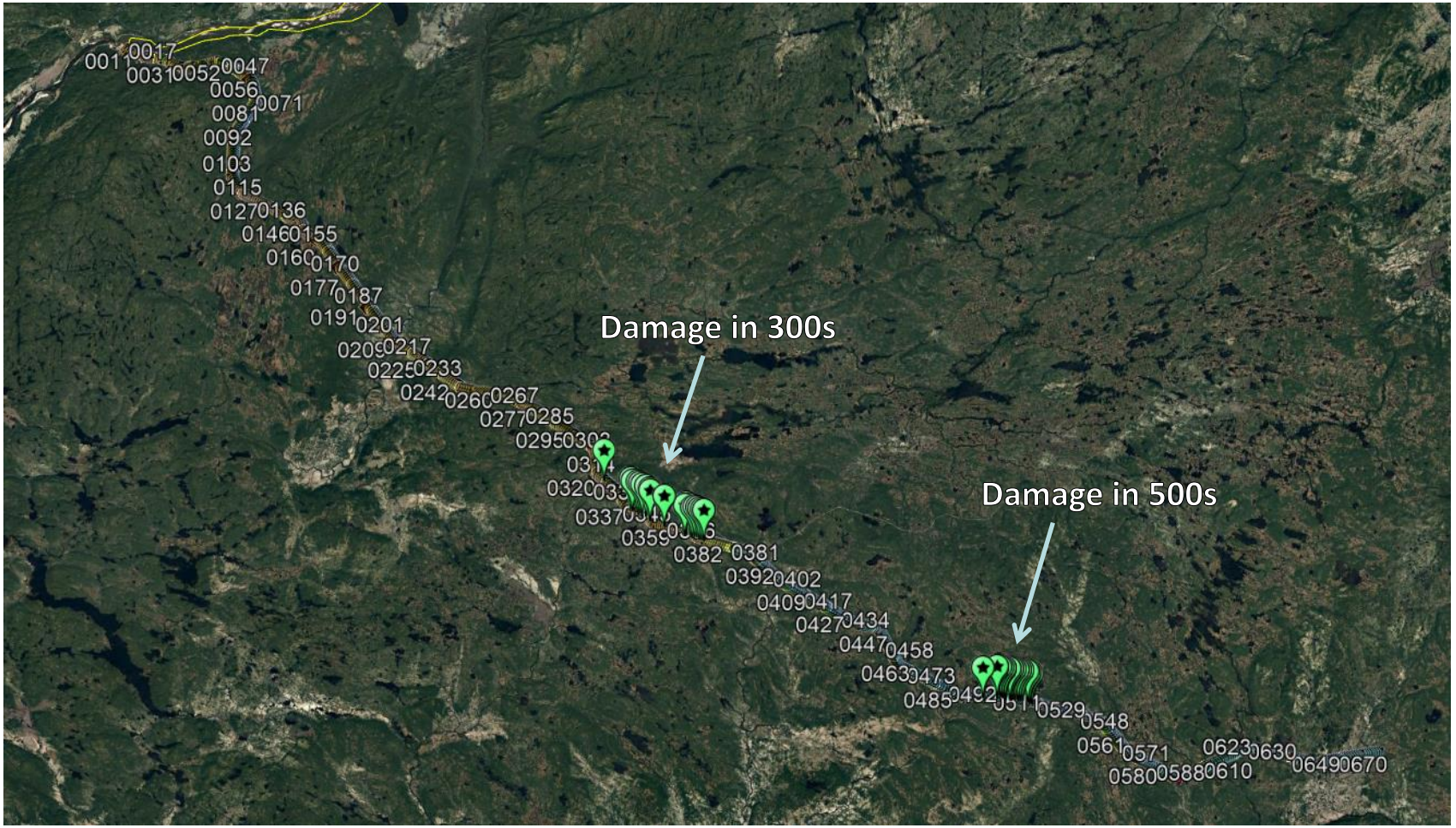
Damage in 300s
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Damage in 300s
Damage in 500s