

1 Q. LAB-NLH-55 Re: Re: LAB-NLH-003

2

3 **Preamble:**

4 Tables 3-4(i) through 3-4(v) indicate SAIFI and SAIDI for the Island Interconnection
5 System, the Labrador Interconnected System, the L’Anse au Loup system, and the
6 Island and Labrador Isolated Systems, respectively.

7

8 The data can be reorganized as follows:

SAIFI	2012	2013	2014	2015	2016
IIS	3.24	4.31	4.51	4.96	7.31
LIS	5.44	8.74	9.76	10.48	5.06
L’Anse au Loup	6.36	4.05	18.79	11.42	7.60
Island Isolated	2.69	2.85	3.63	2.34	2.35
Labrador Isolated	9.10	6.82	12.37	9.91	7.83

SAIDI	2012	2013	2014	2015	2016
IIS	7.58	16.77	14.92	13.17	19.43
LIS	9.28	28.56	26.48	28.81	10.62
L’Anse au Loup	8.54	5.40	22.21	8.60	4.54
Island Isolated	4.93	2.55	4.56	0.60	4.97
Labrador Isolated	14.48	7.16	17.46	22.30	10.29

9 For both SAIFI and SAIDI, the figures for the Labrador Interconnected System are
10 substantially greater than those for the Island Interconnected System in most years.

1 For both SAIFI and SAIDI, the figures for the Labrador Isolated System are
2 substantially greater than those for the Island Isolated System in all years.

3

4 Please:

- 5 a) Confirm that the tables presented in the Preamble accurately represent the
- 6 data in Tables 3-4(i) through (v);
- 7 b) Confirm the affirmations in the preamble comparing the SAIFI and SAIDI values
- 8 for the various systems;
- 9 c) Explain why the SAIFI and SAIDI values are so much higher, in most years, for
- 10 the Labrador systems than they are for the Island systems.

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12

13 A. a) It is confirmed.

14

15 b) The arithmetic calculation used in the affirmations in the preamble is correct.

16

17 c) The calculation for SAIFI¹ is as follows:

$$\text{SAIFI} = \frac{\text{Total Customer Interruptions}}{\text{Total Customers Served}}$$

18 The calculation for SAIDI² is as follows:

$$\text{SAIDI} = \frac{\text{Total Customer-Hours of Interruptions}}{\text{Total Customers Served}}$$

¹ System Average Interruption Frequency Index (SAIFI) is a reliability KPI for distribution service and measures service continuity in terms of the average number of sustained interruptions per customer per year.

² System Average Interruption Duration Index (SAIDI) is a reliability KPI for distribution service and measures service continuity in terms of average cumulative duration of outages per customer served during the year. Measured in hours.

1 **Interconnected Systems**

2 The higher Labrador Interconnected System (LIS) SAIDI from 2013 to 2015
3 resulted from long interruptions required to improve system reliability through
4 the Labrador City Voltage Conversion project and Wabush Terminal Station
5 Improvement project. The higher LIS SAIFI values resulted from a combination
6 of planned interruptions for the Labrador City Voltage Conversion project and
7 Wabush Terminal Station Improvement project and unplanned interruptions
8 resulting from lightning on the transmission system.

9

10 Further, for the Island Interconnected System (IIS) there are approximately
11 23,600 customers served compared to 11,000 customers served on the LIS. Due
12 to the smaller number of customers for the LIS, a higher impact on SAIFI and
13 SAIDI values will result for each sustained interruption and each minute of
14 duration of all interruptions as compared to the IIS.

15

16 While the LIS has fewer customers than IIS, the LIS customers are in two load
17 centers only, Labrador West and Happy Valley-Goose Bay, as compared to 15
18 centers in the IIS. This results in a situation whereby interruptions affecting all
19 or larger parts of the LIS centers will have higher SAIDI and SAIFI values, as each
20 interruption to a load center affects a material portion of the LIS.

21 Comparatively, when the IIS has an interruption to a load center, it affects one
22 of 15 centers and thereby fewer customers.

23

24 **Isolated Systems**

25 The Island Isolated System has not experienced any long duration interruptions
26 in the past five years whereas the Labrador Isolated System has experienced a
27 number of long duration interruptions in that period.

1 The following lists the long duration interruptions for the Labrador Isolated
2 systems. The listing is below:

- 3 • March 2012 – Black Tickle – 41 hour outage to due fire at diesel plant.
- 4 • April 2013 – Mary’s Harbour – 8 hour planned outage to make
5 improvements at diesel plant.
- 6 • August 2013 – Hopedale – 7 hour outage to replace starter on diesel unit.
- 7 • October 2014 – Hopedale – 11 hour planned outage to make improvements
8 to the distribution system.
- 9 • November 2014 – Mary’s Harbour – 25 hour outage due to problem with
10 main power transformer at substation.
- 11 • February 2015 – Rigolet – 25 hour outage due to heavy ice build-up on
12 diesel unit radiators.
- 13 • September/October 2015 – Nain – Six planned outages totalling 39 hours to
14 upgrade the distribution system.
- 15 • October 2016 – Cartwright – 20 hours – Planned outage to replace
16 substation transformers.