Q. **Reference: Labrador Expansion Study, pp. 18-19 (pp. 26-27 pdf)**

Citation:

> A load flow analysis was performed to assess the network of 46 kV transmission lines that supply Hydro Rural customers in Labrador City and Wabush. …
>
> The results of the analysis indicate that transmission lines overloads exist in peak load conditions. To prevent the thermal overloading in the baseline forecast condition, the reconductoring of 46 kV transmission lines L32, L33, and L40 is required. The capital cost associated with this work is estimated to be approximately $1.4 million. This work will ensure sufficient capacity to meet peak load conditions for the 25-year study period.
>
> To prevent overload conditions in the sensitivity forecast condition, the reconductoring noted above, as well as that of L36, is required. The capital cost associated with this work is estimated to be approximately $1.8 million. This work will ensure sufficient capacity to meet peak load conditions for the 25- year study period. (underlining added)

a) Please indicate for how many hours per year these overload conditions are experienced, in both the base and sensitivity cases.

b) Please indicate for how many hours per year these overload conditions would be experienced, in both the base and sensitivity cases, if all existing and future data centre loads were curtailed during the peak 300 hours.

A. a) Table 1 provides the number of hours per year that overload conditions are experienced in Labrador City for the baseline load forecast cases. Newfoundland and Labrador Hydro notes that no overload conditions exist for the Town of Wabush in the Baseline scenario.

**Table 1: Total Hours of Overload Conditions for the Baseline Load Forecast Cases**

| Year | Labrador City Overload Hours |
|---|---|
| 2018 | 95 |
| 2019 | 97 |
| 2020 | 116 |
| 2021 | 122 |
| 2022 | 127 |
| 2023 | 134 |
| 2024 | 137 |
| 2025 | 145 |
| 2026 | 153 |
| 2027 | 156 |
| 2028 | 160 |
| 2029 | 164 |
| 2030 | 169 |
| 2031 | 175 |
| 2032 | 182 |
| 2033 | 185 |
| 2034 | 192 |
| 2035 | 195 |
| 2036 | 204 |
| 2037 | 211 |
| 2038 | 214 |
| 2039 | 222 |
| 2040 | 228 |
| 2041 | 233 |
| 2042 | 247 |
| 2043 | 252 |

Table 2 provides the number of hours per year that overload conditions are experienced for the sensitivity load forecast cases, which include the future data centre loads.

**Table 2: Total Hours of Overload Conditions for the Sensitivity Load Forecast Cases**

| Year | Labrador City Overload Hours | Wabush Overload Hours |
|---|---|---|
| 2018 | 95 | 0 |
| 2019 | 97 | 0 |
| 2020 | 976 | 0 |
| 2021 | 1692 | 0 |
| 2022 | 2580 | 34 |
| 2023 | 2596 | 39 |
| 2024 | 2622 | 39 |
| 2025 | 2651 | 49 |
| 2026 | 2667 | 59 |
| 2027 | 2681 | 62 |
| 2028 | 2703 | 71 |
| 2029 | 2728 | 75 |
| 2030 | 2742 | 75 |
| 2031 | 2762 | 80 |
| 2032 | 2782 | 92 |
| 2033 | 2794 | 92 |
| 2034 | 2813 | 100 |
| 2035 | 2835 | 108 |
| 2036 | 2856 | 108 |
| 2037 | 2874 | 114 |
| 2038 | 2882 | 125 |
| 2039 | 2896 | 125 |
| 2040 | 2909 | 143 |
| 2041 | 2931 | 152 |
| 2042 | 2944 | 152 |
| 2043 | 2952 | 160 |

b) Table 3 provides the number of hours per year that overload conditions are experienced for the baseline load forecast cases when the existing data centre loads were curtailed during the peak 300 hours.

**Table 3: Total Hours of Overload Conditions for the Baseline Load Forecast Cases with Existing Data Centres Curtailed**

| Year | Labrador City Overload Hours |
|---|---|
| 2018 | 0 |
| 2019 | 0 |
| 2020 | 0 |
| 2021 | 0 |
| 2022 | 0 |
| 2023 | 0 |
| 2024 | 1 |
| 2025 | 1 |
| 2026 | 2 |
| 2027 | 2 |
| 2028 | 5 |
| 2029 | 6 |
| 2030 | 6 |
| 2031 | 6 |
| 2032 | 6 |
| 2033 | 9 |
| 2034 | 12 |
| 2035 | 12 |
| 2036 | 16 |
| 2037 | 18 |
| 2038 | 20 |
| 2039 | 23 |
| 2040 | 29 |
| 2041 | 33 |
| 2042 | 36 |
| 2043 | 38 |

Table 4 provides the number of hours per year that overload conditions are experienced for the Sensitivity load forecast cases, if all existing and future data centre loads were curtailed during the peak 300 hours.

**Table 4: Total Hours of Overload Conditions for the Sensitivity Load Forecast Cases with Data Centres Curtailed during Peak 300 Hours**

| Year | Labrador City Overload Hours | Wabush Overload Hours |
|---|---|---|
| 2018 | 0 | 0 |
| 2019 | 0 | 0 |
| 2020 | 676 | 0 |
| 2021 | 1392 | 0 |
| 2022 | 2280 | 0 |
| 2023 | 2296 | 0 |
| 2024 | 2323 | 0 |
| 2025 | 2352 | 0 |
| 2026 | 2368 | 0 |
| 2027 | 2382 | 0 |
| 2028 | 2405 | 0 |
| 2029 | 2430 | 0 |
| 2030 | 2446 | 0 |
| 2031 | 2468 | 0 |
| 2032 | 2488 | 0 |
| 2033 | 2500 | 0 |
| 2034 | 2519 | 0 |
| 2035 | 2541 | 0 |
| 2036 | 2562 | 0 |
| 2037 | 2580 | 0 |
| 2038 | 2589 | 0 |
| 2039 | 2605 | 0 |
| 2040 | 2621 | 0 |
| 2041 | 2643 | 0 |
| 2042 | 2657 | 0 |
| 2043 | 2667 | 0 |