Q. **Reference: Reliability and Resource Adequacy Study 2022 Update, Volume III, page 19, lines 2-3.**

Detail and describe each specific change Hydro would make to the Haldar & Associates worst case weather scenarios and historical data supporting them.

A. The reliability information presented by Haldar & Associates Inc. ("Haldar & Associates") is based on the worst-case scenario outlined in CSA 22.3 No. 60826-10;[1] as such, it assumes the combined loading associated with the 85/40 extreme values. The standard provides a range between 0.6 and 0.85 for the upper limit of wind and ice loading but does not provide clear direction on when the upper or lower values should be utilized. This range in the standard provides the designer with the ability to select the factors based on local experience; if no relevant data is available, the designer can choose to be conservative by selecting the higher value. In this particular case, Haldar & Associates utilized the higher values to complete the assessment.

Wind data obtained from Environment Canada for Zone 3A, the section that governs the overall line reliability, indicates that the historical wind in the area is lower than the criteria used for the 85/40 extreme limit. Refer to Table 1.

Table 1: Wind Speed Data for Zone 3A (km/hr)

Zone 3A	Historical Data[2]	Design Data
Wind Speed Ten-Minute Average	94	120
85% of Wind Speed Ten-Minute Average	80	102
60% of Wind Speed Ten-Minute Average	56	72

Newfoundland and Labrador Hydro feels it would be more practical to accept a lower limit of the combined wind and ice design criteria when completing the reliability analysis to accurately

[1] Canadian Standards Association. (2010). CSA 22.3 No. 60826-10, *Design Criteria of Overhead Transmission Lines* is a national standard that specifies the loading and strength requirements of overhead lines derived from reliability-based design principles.
[2] Historical data: 70 years.

reflect the winds experienced in the area and give a realistic view of the overall reliability. It can be uneconomical to use a design wind speed of 120 km/hr (ten-min average) for the extreme event when historical data indicates that the highest winds in the area over the last 70 years have been 94 km/hr (ten-minute average). This would result in a more conservative design that would have the potential to result in higher costs. During design, this additional cost could be weighed against the potential risk of failure, now that the line is completed; the higher numbers may give the impression that there are more areas of concern than there are actually. If a lower wind and ice combination were utilized, the number of structures exceeding 100% utilization would be reduced and the probability of failure would decrease, thereby providing a higher return period.