Q. **Reference: Economic and Technical Assessment, page 21 (p. 55 pdf)**

Citation:

> With an electrical interconnection and the 25 kV voltage conversion of southern Labrador distribution systems, the fault levels on these systems will increase as shown in Table 5, therefore minimizing the effect of voltage flicker during motor starting.

a. Please explain the relationship between fault levels, "available fault current", and voltage flicker.

A. The available fault current is the maximum amount of current that can be delivered to the electrical equipment (customer) under a fault or motor starting condition. The amount of motor starting or fault current available will increase as the distribution system voltage increases.

The voltage flicker is a transient phenomenon that occurs when large loads are switched on the system causing an instantaneous change in voltage. Usually this is experienced when large amount of inrush current is required to start a motor. In these cases, a short-term dip in voltage is experienced due to the short-term increase in current flow. This can cause lights to flicker or motor operation to be interrupted. The magnitude of voltage flicker depends on the amount of available fault current at a particular location. If the available fault current is high, the voltage flicker associated with a certain amount of inrush current will be less. Newfoundland and Labrador Hydro ("Hydro") communicates inrush current limits to customers to limit voltage flicker.

The 25 kV voltage conversions of the southern Labrador distribution systems will create a more robust distribution system with higher amounts of available fault current. The increased fault current will allow Hydro's customers to start larger motors without impacting other customers on the system with voltage flicker.