Q. **Projects over $50,000 but Less Than $200,000**

Tab 25 Construct Second Distribution Feeder, Nain:

Hydro outlines that during extreme operating conditions, customer service entrance nominal voltage must range between 106 volts for single phase customers and 110 volts for three-phase customers to a maximum of 127 volts for a nominal 120-volt service. Please outline what does Hydro mean when it refers to "extreme operating conditions".

A. Table 1 displays the normal and extreme operating condition nominal voltage ranges for many types of electrical services. This table was taken from CSA Standard CAN3–C235–83 (R2006) – Preferred Voltage Levels for AC Systems 0 – 50,000 V, Table 3 - Recommended Voltage Variation Limits for Circuits up to 1000 V, at Service Entrances.

Standard CAN3-C235-83 (R2006) defines an extreme operating condition as follows:

> *Where voltages lie outside the indicated limits for normal operating conditions but within the indicated limits for extreme operating conditions improvement or corrective action should be taken on a planned and programmed basis but not necessarily on an emergency basis. Where voltages lie outside the indicated limits for extreme operating conditions, improvement or corrective action should be taken on an emergency basis. The urgency for such action will depend on many factors such as location and nature of load or circuit involved, extent to which limits are exceeded with respect to voltage levels and duration, etc.*

Table 1: Recommended Voltage Variation Limits for Circuits up to 1000V, at Service Entrances

Nominal System Voltages	Voltage Variation Limits Applicable at Service Entrances			
		Extreme Operating Conditions		
		Normal Operating Conditions		
Single-Phase (V)	**Lower Limit**		**Upper Limit**	
120/240	106/212	110/220	125/250	127/254
240	212	220	250	254
480	424	440	500	508
600	530	550	625	635
Three-Phase 4-Conductor (V)				
120/208Y	110/190	112/194	125/216	127/220
240/416Y	220/380	224/338	250/432	254/440
277/480Y	245/424	254/440	288/500	293/508
347/600Y	306/530	318/550	360/625	367/635
Three-Phase 3-Conductor (V)				
240	212	220	250	254
480	424	440	500	508
600	530	550	625	635