

APPENDIX 1

Form of Connection Agreement

(Note: Version A and B of Appendix 1 are published as separate documents)

Appendix 1: Version A - Form of Connection Agreement for Load Customers

Appendix 1: Version B - Form of Connection Agreement for Generator Customers

APPENDIX 2

TRANSMISSION SYSTEM CONNECTION POINT PERFORMANCE STANDARDS

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TRANSMISSION SYSTEM CONNECTION POINT PERFORMANCE STANDARDS

Ref	Item	Requirement		
1	Voltage variations	Transmission voltages of 500 kV, 230 kV and 115 kV shall be maintained in accordance with the Market Rules. Voltages below 50 kV shall be maintained in accordance with CSA 235		
2	Fault Levels Higher values may exist for short times during switching	Nominal Voltage (kV)	Maximum 3-Phase Fault (kA)	Maximum SLG Fault (kA)
		500	80	80
		230	80	80
		115	50	50
		44	20	19
		27.6 (4-wire)	17	12
		27.6 (3-wire)	17	0.45
13.8	21	10		
3	Circuit Breaker Interrupting and Automatic Single Shot Reclose Time	Nominal Voltage (kV)	Rated Interrupting Time (cycles)	Automatic Reclose Time (Seconds)
		500	#2	10-15
		230	#3	5-15
		115	#5	3-6
		< 50	#8	varies significantly
4	Unbalance	Voltage unbalance is limited to 2% (CAN/CSA E 1000 2-2-97)		
5	Flicker	Voltage flicker shall be limited as tabulated.		
		Magnitude (%)	Limit	
		0.5	3 per second	
		1.0	20 per minute	
		2.0	45 per hour	
		3.0	4 per day	
		A higher flicker may be acceptable for infrequent starts.		
6	Switching Surges	All equipment shall be able to withstand capacitor switching surges that transiently increase voltage to twice normal levels.		
7	Voltage Harmonics	Voltage harmonics shall respect limitations described in Table 11.1 Voltage Distortion Limits IEEE Std 519-1992		
8	Current Harmonics	Current harmonics shall respect limitations described in Tables 10.3 to 10.5 Current Distortion Limits IEEE Std 519-1992.		
9	Telephone Interference	I.T. Product balanced (in phase conductors) shall be less than 5,000 amperes		
		I.T. Product residual (in ground return path) shall be less than 250 amperes		

APPENDIX 3

INFORMATION TO BE MADE AVAILABLE TO CUSTOMERS BY TRANSMITTERS

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INFORMATION TO BE MADE AVAILABLE TO CUSTOMERS BY TRANSMITTERS

A customer is only entitled to the following information to the extent that it is available, that it relates specifically to its own existing or proposed connection and that it is relevant to that connection.

1. Nominal supply voltage and insulation-class requirements.
2. Minimum time required before power is made available at the proposed location.
3. Space and other requirements for billing, metering and other equipment, and details regarding any necessary ancillary facilities.
4. Preliminary requirements for conductor spacing and line tension for the interface structure.
5. Long-term voltage variation (to select fixed taps and indicate need to provide for future voltage control).
6. Short-term voltage variation (to select ULTC or regulator range).
7. Temporary overvoltages due to faults or the operation of special protection systems.
8. Voltage dips caused by transmission system faults and the starting of motors, voltage variations caused by capacitor switching, and other transients caused by transmission system operation.
9. Short-circuit infeed from the transmission system: initial, maximum future, minimum normal, and minimum emergency.
10. Transformer connection and grounding requirements.
11. Protective relaying requirements.
12. Transmission system frequency variations at the connection point.
13. Voltage flicker at the connection point.
14. Voltage unbalance at the connection point.
15. Voltage harmonics at the connection point.
16. Operating information:
 - feeder amperes per phase;
 - bus voltage;
 - real and reactive power flow per feeder (where available; otherwise per bus level);
 - feeder breaker open/close status;
 - feeder breaker recloser blocked/not blocked status;
 - bus tie breaker open/close status;
 - capacitor bank breaker open/close status;
 - energy pulse output in kW.h and kVar.h per customer feeder;
 - energy pulse output in kW.h and kVar.h per station bus; and
 - transformer/bus breaker open/close status.

APPENDIX 4

CUSTOMER FINANCIAL RISK CLASSIFICATION

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CUSTOMER FINANCIAL RISK CLASSIFICATION

This Appendix sets out the manner in which a transmitter shall determine the risk associated with a proposed new or modified connection of a load customer for the purposes of carrying out an economic evaluation under this Code.

The risk associated with a proposed new or modified connection of a load customer shall be classified by a transmitter as falling within one of the following risk categories: high risk, medium-high risk, medium-low risk and low risk. The transmitter shall determine the appropriate risk classification by determining the Altman Z-score for the load customer using the following formula:

$$Z = .717 * X_1 + .847 * X_2 + 3.11 * X_3 + .42 * X_4 + .998 * X_5$$

where

X_1 = net working capital/total assets

X_2 = retained earnings/total assets

X_3 = earnings before interest and taxes / total assets

X_4 = shareholders equity/total liabilities

X_5 = sales/total assets

The intervals of the Altman Z-score and the corresponding risk classification are set out in the table below:

Altman Z-score	Risk Classification
< 1.20	High risk
1.20 - 2.05	Medium-High risk
2.05 - 2.9	Medium-Low risk
> 2.9	Low risk

Where a load customer has not provided the transmitter with some or all of the information necessary to determine the customer's Altman Z-score as described above, the transmitter may use estimates based on comparable information provided by other similarly-situated customers. Where no such comparable information is available or where the transmitter considers that the customer's circumstances are such as to render comparisons with similarly-situated customers inappropriate, the transmitter may classify the risk associated with the proposed new or modified connection as high risk.

APPENDIX 5

METHODOLOGY AND ASSUMPTIONS FOR ECONOMIC EVALUATIONS

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METHODOLOGY AND ASSUMPTIONS FOR ECONOMIC EVALUATIONS

A transmitter shall use the methodology set out in this Appendix to conduct any economic evaluation under this Code. This methodology consists of a discounted cash flow (DCF) calculation for the connection of load customer's new or modified facilities using the methodology set out below. As required by section 6.5.2, separate economic evaluations must be conducted for transformation connection facilities and line connection facilities.

<u>Net Present Value ("NPV")</u>	=	Present Value ("PV") of Operating Cash Flow + PV of Capital Cost Allowance ("CCA") Tax Shield - PV of Capital, calculated over the economic evaluation period.
1. <u>PV of Operating Cash Flow</u>	=	P V of Net Operating Cash (before taxes) - P V of Taxes
a) PV of Net Operating Cash	=	PV of (Annual Connection Revenue - Annual Connection Operating Maintenance & Administration ("OM&A") Costs).
Annual Connection Revenue	=	The relevant annual connection rates revenue derived from that part of the customer's new load that exceeds the total normal operating capacity of any connection facility already serving that customer and which will be served by a new connection facility or modification
Annual Connection OM&A Costs	=	The relevant annual administrative costs associated with supply of the customer plus the relevant annual operating and maintenance costs associated with new or modified connection facilities of the transmitter.
b)PV of Taxes	=	PV of Municipal Taxes + PV of Capital Taxes + PV of Income Taxes (before Interest tax shield)
Annual Municipal Taxes	=	(Municipal Tax Rate) * (Assessed Value of Relevant Property)
Annual Capital Taxes	=	(Capital Tax Rate) * (Relevant Closing Undepreciated Capital Cost Balance)
Relevant Closing Undepreciated Capital Cost Balance	=	That portion of the transmitter's Closing Undepreciated Capital Cost Balance attributed to the new or enhanced connection assets associated with the specific connection.
Annual Income Taxes	=	(Income Tax Rate) * (Net Annual Operating Cash - Annual Municipal Taxes - Annual Capital Taxes)
Net Annual Operating Cash	=	(Annual Connection Revenue - Annual Connection OM&A)

2. PV of CCA Tax Shield = $[(\text{Income Tax Rate}) * (\text{CCA Rate}) * (\text{Total Annual Capital Expenditure})] / [(\text{CCA Rate} + \text{Discount Rate})]$
- CCA Rate = Capital Cost Allowance Rate
- Total Annual Capital Expenditure = Sum of the total relevant Annual Capital Expenditures of the transmitter.
3. PV of Capital = P V of Annual Capital Expenditures
- Annual Capital Expenditures = The relevant annual capital expenditures of the transmitter based on fully allocated costing principles including capital for new connection facilities and/or modified connection facilities to accommodate the proposed new or upgraded customer connection and any transfer price paid to a customer for any facilities built under an alternative bid option and transferred to the transmitter.

Notes:

The Capital Tax Rate is a combination of the Federal Large Corporation Tax Rate and the Provincial Capital Tax Rate.

The Income Tax Rate is a combination of the Federal Income Tax Rate and the Provincial Income Tax Rate.

Land is not eligible for CCA.

The PV of CCA Tax Shield can also be calculated annually and present valued in the PV of Taxes calculation. An adjustment is needed to account for the ½ year CCA rule.

For purposes of the calculations above, a transmitter shall ensure that the most up-to-date current and future federal and provincial tax rates are being used.

Assumptions

1. The economic evaluation period shall be determined as follows based on the risk classification of the proposed new or modified connection as determined by the transmitter in accordance with Appendix 4:

<u>Risk Classification</u>	<u>Economic Evaluation Period</u>
High Risk	5 years
Medium-High Risk	10 years
Medium-Low Risk	15 years
Low Risk	25 years

2. The discount rate to be used in the DCF calculation shall be based on the transmitter’s current deemed debt-to-equity ratio, debt and preference share costs and Board-approved rate of return on equity. Up-front capital expenditures will be discounted at the beginning

of the project year and capital expended throughout the year will be mid-year discounted. The same approach to discounting will be used for revenues and OM&A expenditures.

3. Capital costs shall be based on the minimum standard design required to supply the forecasted customer load except where the new or modified facility was previously planned by the transmitter, in which case the capital costs shall be limited to the cost of advancement as required by section 6.5.2.