
1 Q. **T&D Planning**

2 Provide a list of Hydro's transmission lines by voltage. Indicate ampacity ratings at 0
3 degrees Celsius and the peak demand anticipated for each line for next winter with
4 all systems in normal configurations. Confirm that the average demand on each line
5 doesn't exceed about 50% of the peak demand.

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8 A. Tables 1, 2 and 3 provide listings of Hydro's 230 kV, 138 kV and 66/69 kV
9 transmission lines respectively including the MVA rating at 0°C, the anticipated
10 2014/2015 winter peak, and the anticipated average line load for 2015.

Table 1 – 230 kV Transmission Line Loads for 2015

<i>Line #</i>	<i>Rating at 0° C [MVA]</i>	<i>Anticipated Peak [MVA]</i>	<i>Average Loading [MVA]</i>	<i>Percentage</i>
TL201 ¹	322.2	171.6	108.1	63%
TL202 ¹	369.5	244.6	175.8	72%
TL203 ¹	347	151.4	96.2	64%
TL204	469.6	89.5	45.6	51%
TL205	322.2	38	22.0	58%
TL206 ¹	369.5	244.4	176.6	72%
TL207	453.9	205.8	123.3	60%
TL208 ²	369.5	55.5	38.0	68%
TL209 ³	369.5	45.4	28.7	63%
TL211 ⁴	322.2	42.2	28.5	68%
TL217	453.9	183.8	95.3	52%
TL218	369.5	242.5	94.5	39%
TL228 ⁴	282.3	38.9	26.9	69%
TL231	469.6	89.5	34.7	39%
TL232	469.6	37.7	10.9	29%
TL233 ⁴	369.5	41	15.6	38%
TL234 ⁵	469.6	125.5	79.7	64%
TL235 ⁶	322.2	86.1	64.3	75%
TL236	459.6	127.5	68.5	54%
TL237 ¹	459.6	130.2	79.7	61%
TL242	459.6	266.7	77.0	29%
TL247 ⁷	466.6	132.5	85.3	64%
TL248 ⁷	466.6	127.2	85.5	67%
TL263 ⁸	369.5	41.9	30.8	74%

Notes:

1. 230 kV transmission lines east of Bay d'Espoir exhibit relatively high average loads given Hydro's maximization of off Avalon Peninsula hydro-electric resources prior to the start of the Holyrood Thermal Generating Station.
2. TL208 is a radial 230 kV transmission line that connects industrial load.
3. TL209 is a radial 230 kV transmission line that connects both Newfoundland Power load and the Stephenville combustion turbine that is used for voltage control on the western portion of the system. Operation of the Stephenville combustion turbine in synchronous condenser mode increases the average load on TL209.
4. Under light load conditions experienced during warm summer nights, TL233 is taken out of service to reduce 230 kV system voltages on the west coast. As a result, average loads on TL211 and TL228 are increased while TL233 are reduced.
5. TL234 connects Upper Salmon and Granite Canal hydro-electric generating stations to the Island Interconnected System. The average load on this line is dependent upon the production of the two hydro stations.
6. TL235 connects Exploits generation at Grand Falls and Bishops Falls to the Island Interconnected System. The average load on this line is dependent upon the production of the two hydro stations.
7. TL247 and TL248 connect the Cat Arm hydro-electric generating station to the Island Interconnected System. The average load on these two lines is dependent upon the production of the Cat Arm plant.
8. TL263 connects the Granite Canal hydro-electric generating station to the Island Interconnected System. The average load on this line is dependent upon the production of the Granite Canal plant.

Table 2 – 138 kV Transmission Line Loads for 2015

Line #	Rating at 0° C [MVA]	Anticipated Peak [MVA]	Average Loading [MVA]	Percentage
TL210	144.1	67.6	43.9	65%
TL212	112.4	26.1	9.4	36%
TL214	112.4	27.8	11.9	43%
TL219	161.7	28.8	12.2	42%
TL222 ¹	112.4	11.1	10.5	95%
TL223 ¹	92.7	19.5	18.9	97%
TL224 ¹	92.7	38	27.0	71%
TL239	161.7	38.6	23.1	60%
TL241 ²	160.8	24.6	14.4	59%
TL243 ³	161.7	83	49.8	60%
TL244 ²	112.6	21.9	12.1	55%
TL245 ¹	112.6	39.1	26.7	68%
TL250 ⁴	161.7	7.8	6.8	87%
TL256 ⁵	160.8	16.5	11.0	66%
TL259	161.7	35.4	18.2	51%
TL260	161.7	9.6	6.2	60%

Notes:

- Both Hinds Lake and Cat Arm generation is on during system peak load conditions. The status of Hinds Lake generation has a significant impact on 138 kV transmission line flows between Deer Lake and Stony Brook.
- TL241 has two 5 MVAR 138 kV shunt reactors and TL244 has one 5 MVAR, 138 kV shunt reactor normally in service to maintain acceptable system voltages for sudden loss of load and during light load conditions. The reactors impact the line loading.
- TL243 connects Hinds Lake hydro-electric generating station to the Island Interconnected System. The average load on this line is dependent upon the production of the Hinds lake plant.
- TL250 is a relatively long 138 kV transmission line that is lightly loaded. The average line load as viewed from Bottom Brook Terminal Station is influenced by the line charging during lighter load conditions.
- TL256 connects the St. Anthony – Roddickton area to the Island Interconnected System. The 3 x 3 MVAR, 69 kV switched shunt capacitor banks at the St. Anthony Airport Terminal Station influence the average load on this line.

Table 3 – 66/69 kV Transmission Line Loads for 2015

Line #	Rating at 0° C [MVA]	Anticipated Peak [MVA]	Average Loading [MVA]	Percentage
TL215 ¹	46	22.1	8.5	38%
TL220	56.2	14.7	6.5	44%
TL221	53.8	7	4.0	57%
TL225 ²	53.8	23	20.1	87%
TL226	53.8	6.9	3.2	46%
TL227	53.8	2	0.8	40%
TL229	53.4	2.3	1.1	48%
TL251 ³	56.2	1.3	0.7	56%
TL252 ³	56.2	2.1	1.0	48%
TL253 ³	56.2	4	1.3	46%
TL254	80.8	7.1	3.8	53%
TL257	56.2	3.5	2.0	57%
TL261	76.9	11.6	6.7	58%
TL262	53.8	2	1.2	60%
TL264 ⁴	53.8	7.4	5.9	80%
TL280 ⁵	53.8	17.9	17.2	96%

Notes:

1. TL215 peak assumes Rose Blanche Brook hydro plant on at 5.7 MW during peak.
2. TL225 connects Deer Lake Power generation to Deer Lake Terminal Station and is a path for power deliveries to Corner Brook Pulp and Paper mill via 230 kV to Massey Drive.
3. Assumes Rattle Brook generation on line during peak load conditions.
4. Duck Pond Mine expected to close during 2015.
5. TL280 connects Star Lake hydro-electric generating station to the Island Interconnected System. The average load on this line is dependent upon the production of the Star Lake plant.