Q. **T&D Planning**

Provide the peak demand anticipated for each transformer for each of Hydro's terminal station and substation transformers for next winter with all systems in normal configurations. Confirm whether the average demand on each transformer doesn't exceed about 50% of the peak demand.

A. Please see the following table:

Hydro 2015 Transformer Loading				
Station	***Transformer***	***Anticipated Peak MVA***	***Average Load MVA***	***Percentage***
Oxen Pond	T1: 150/200/250 MVA	146.8	74.6	51%
	T2: 75/100/125 MVA	71.6	36.4	51%
	T3: 150/200/250 MVA	146.8	74.6	51%
Hardwoods[1]	T1: 75/100/125 MVA	78.0	41.2	53%
	T2: 40/53.3/66.6 MVA	39.8	21.0	53%
	T3: 40/53.3/66.6 MVA	43.0	22.7	53%
	T4: 75/100/125 MVA	77.4	40.9	53%
Holyrood[2]	T5: 15/20/25 MVA	16.7	6.8	41%
	T6: 25/33.3/41.7 MVA	12.6	3.8	30%
	T7: 25/33.3 41.7 MVA	12.6	4.0	32%
	T8: 75/100/125 MVA	36.5	12.9	35%
	T10: 25/33.3/41.7 MVA	16.3	7.2	44%
Western Avalon[3]	T1: 15/20/25 MVA	16.7	9.4	56%
	T2: 15/20/25 MVA	16.3	7.9	48%
	T3: 25/33.3/41.7 MVA	12.6	7.0	55%
	T4: 25/33.3/41.7 MVA	12.6	6.0	48%
	T5: 75/100/125 MVA	36.5	17.6	48%
Voisey's Bay Nickel[4]	T1: 75/100/125 MVA	27.7	19.0	69%
	T2: 75/100/125 MVA	27.7	19.0	69%
Come By Chance[5]	T1: 30/40/50 MVA	15.3	13.6	89%
	T2: 30/40/50 MVA	15.3	13.6	89%
Sunnyside	T1: 75/100/125 MVA	64.7	19.5	30%

Hydro 2015 Transformer Loading				
Station	***Transformer***	***Anticipated Peak MVA***	***Average Load MVA***	***Percentage***
	T4: 75/100/125 MVA	64.7	19.5	30%
Bay d'Espoir	T10: 15/20/25 MVA	11.2	5.6	50%
	T11: 10/13.3/16.6 MVA	7.6	4.3	57%
	T12: 15/20/25 MVA	11.2	5.6	50%
Conne River[6]	T1: 2.5/3.33 MVA	3.1	1.4	44%
English Harbour West[6]	T1: 5/6.5 MVA	2.7	1.2	44%
Barachoix[6]	T1: 10/13.3/16.6 MVA	8.3	3.6	44%
Stony Brook	T1: 75/100/125 MVA	96.6	49.9	52%
	T2: 75/100/125 MVA	96.4	50.0	52%
South Brook	T1: 5/6.6/8.3 MVA	7.2	4.3	60%
Bottom Waters[7]	T1: 10.13.3/16.6 MVA	9.8	6.0	61%
Buchans[8]	T1: 40/53.3/66.6 MVA	13.1	9.3	71%
	T2: 5/6.6/8.3 MVA	1.0	0.7	70%
Hampden	T1: 2.5/3.3/4 MVA	1.1	0.5	45%
Jackson's Arm	T1: 5/6.6/8.3 MVA	2.3	1.1	48%
Coney Arm[9]	T1: 2.5/3.3/4 MVA	-	-	-
Howley	T2: 7.5/10/12.5 MVA	1.3	0.7	56%
Deer Lake[10]	T1: 25/33.3/41.7 MVA	9.1	9.9	109%
	T2: 45/60/75 MVA	7.4	15.0	203%
Grandy Brook	T1: 7.5/10/12.5 MVA	5.4	2.3	43%
Massey Drive[11]	T1: 75/100/125 MVA	51.4	39.0	76%
	T2: 40/53.3/66.6 MVA	32.5	15.8	49%
	T3: 75/100/125 MVA	57.7	29.3	51%
Bottom Brook[12]	T1: 25/33.3/41.7 MVA	22.1	10.2	46%
	T2: 15/20/25 MVA	-	-	-
	T3: 25/33.3/41.7 MVA	7.8	6.3	88%
Stephenville	T3: 40/53.3/66.6 MVA	45.3	21.5	47%
Doyles[13]	T1: 25/33.3/41.7 MVA	15.0	8.6	58%
Wiltondale	T1: 1 MVA	0.1	0.05	50%
Gelburnie	T1: 1.5/3.3 MVA	2.3	1.2	52%
Rocky Harbour	T1: 5/6.6/8.3 MVA	4.4	2.2	50%
Berry Hill	T1: 15/20/25 MVA	1.9	0.8	40%
Cow Head	T1:5/6.6/8.3 MVA	1.9	0.8	40%
Parson's Pond[14]	T1: 1/1.33 MVA	0.8	0.5	63%
Daniel's Harbour[14]	T1: 1/1.33 MVA	0.6	0.4	58%
	T2: 1/1.33 MVA	0.5	0.4	70%

Hydro 2015 Transformer Loading				
Station	***Transformer***	***Anticipated Peak MVA***	***Average Load MVA***	***Percentage***
Peter's Barren	T1: 15/20/25 MVA	9.0	4.0	44%
Hawke's Bay	T1: 5/6 MVA	4.5	2.6	58%
	T2: 2.5/3.3 MVA	2.5	1.5	60%
Plum Point	T1: 10/13.3/16.6 MVA	4.0	2.3	58%
Bear Cove	T1: 10/13.3/16.6 MVA	5.7	2.8	49%
St. Anthony Airport[15]	T1: 15/20/25 MVA	15.4	9.6	62%
St. Anthony Diesel	T1: 5/6.7/8.3 MVA	11.3	6.5	58%
Main Brook	T1: 1.5 MVA	0.6	0.3	56%
Roddickton Woodchip	T2: 5/6.7/8.3 MVA	3.0	1.7	57%

Hydro 2015 Transformer Loading				
Station	***Transformer***	***Anticipated Peak MVA***	***Average Load MVA***	***Percentage***

Notes

1. Hardwoods T4 75/100/125 MVA unit from Oxen Pond to replace existing 40/53.3/66.6 MVA unit in 2015.
2. Holyrood T5 and T10 supply station service and Newfoundland Power 66 kV line L38. Transformers T6, T7, T8 supply Holyrood end of Western Avalon to Holyrood 138 kV Loop.
3. Western Avalon transformers supply Western Avalon end of Western Avalon to Holyrood 138 kV Loop. The normal load distribution on the 138 kV loop has Western Avalon transformers more heavily loaded than the Holyrood units.
4. Voisey's Bay Nickel is a new terminal station. The load forecast for 2015 is 55.4 MW as the facility is in start-up mode.
5. Come By Chance Terminal Station supplies the Come By Chance Oil Refinery, which is an industrial load with a high capacity factor.
6. Conne River, English Harbour West and Barachoix average transformer loads based upon average load on TL220 from hourly EMS readings.
7. Bottom Waters average load factor influenced by mining activity on Baie Verte Peninsula.
8. Buchans T1 load assumes Star Lake operating at 18 MW, Buchans hydro at 2 MW and Duck Pond Mine at 7 MW. T2 peak of 2.3 MW with Buchans hydro off. T2 average assumes production from Buchans hydro similar to 2013.
9. Coney Arm transformer is used as an alternate station service supply for Cat Arm Hydro Plant. The transformer has no load under normal operating conditions.
10. Deer Lake transformers T1 and T2 are lightly loaded during winter peak load conditions with both Hinds Lake and Cat Arm generation in service. The load levels on T1 and T2 increase during off peak periods when either Hinds Lake, Cat Arm, or both are out of service or at low load levels. These transformers have a peak outside of the winter period.
11. Massey Drive T1 supplies Corner Brook Pulp and Paper, T2 and T3 supply Newfoundland Power.
12. Bottom Brook T2 is used as an emergency supply for the Stephenville area in the case of a 230 kV line TL209 outage. The transformer has no load under normal operating conditions. T3 average load is impacted by operation of the Rose Blanche hydro-electric station.
13. Doyles T1 load assumes Rose Blanche Brook hydro plant ay 5.7 MW during peak.
14. Average load ratios high due to rounding.
15. St. Anthony Airport T1 connects St. Anthony, Main Brook and Roddickton woodchip loads plus 3 x 3 MVAR 69 kV switched shunt capacitor banks. This reactive support increases the average load.