Q. **T&D Planning**

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

A. Hydro makes a number of assumptions to obtain the ampere rating of a particular sized conductor depending on its construction and geographic location. Generally, the rated capacity of the lines is based on the maximum allowable operating temperature, which is affected by climate. Hydro has also adopted the IEEE738 - IEEE Standard for determining the amperage for conductors used on their distribution systems. This standard outlines the method used to determine the current-temperature of a particular conductor. For distribution systems, Hydro assumes a maximum conductor rating of 75°C, a temperature rise of 45°C and a 30°C ambient temperature. In its use of IEEE Std 738 for distribution conductors, Hydro sets the line latitude at 50° N, the elevation at sea level, the solar absorptivity at 0.5, emissivity at 0.5, and assumes a clear atmosphere. Cooling of the conductors during normal operation due to light cross winds is assumed (2ft/s). All conductors are assumed to be orientated east to west.

Distribution line ampere ratings are further based on the time of the year in which the peak load occurs on that particular feeder. For a winter peaking system, the ambient temperature is assumed to be 0°C. A summer peaking system is assumed to experience an ambient temperature of 30°C.

The table starting on page three lists all of Hydro's distribution feeders on the Island indicating voltage, continuous conductor ratings (at time of peak) and the forecasted 2014 peak demand under normal conditions.

It is not correct to assume average demand on each line would not exceed 50% of peak load. The average and peak demands on a distribution feeder would be dependent on a number of factors including the characteristics of the load supplied by the particular feeder.

System	Feeder #[1,2]	Voltage (kV)	Conductor Rating (kVA) [3]	Peak Demand (kVA)[4]	Feeder Loading vs. Conductor Rating Capacity
Bear Cove	L4*	12.47	8,078	1,690	21%
Bear Cove	L6	12.47	10,648	5,028	47%
Barachoix	L1	24.94	13,694	2,054	15%
Barachoix	L4	24.94	21,296	6,262	29%
Barachoix	L5	2.40	761	10	1%
Bay D'Espoir	L1	24.94	21,296	6,572	31%
Bottom Waters	L1*	24.94	16,156	3,806	24%
Bottom Waters	L2	24.94	13,694	3,541	26%
Bottom Waters	L3	24.94	21,296	3,653	17%
Bottom Waters	L4	12.47	6,863	1,243	18%
Bottom Waters	L8	4.16	1,412	261	18%
Bottom Waters	L6	12.47	4,612	662	14%
Bottom Waters	L7	12.47	6,863	2,283	33%
Cow Head	L1	12.47	6,847	1,944	28%
Conne River	L1	12.47	6,847	2,683	39%
Daniel's Harbour	L1*	12.47	5,227	1,127	22%
English Harbour West	L1	24.94	13,694	3,248	24%
Fleur de Lys	L1	24.94	13,694	639	5%

[1] Feeders supplying power solely to Nalcor facilities were not considered.
[2] *Indicates a non-winter peaking feeder
[3] The amperage used to determine the kVA rating depends on the timing of the feeder's peak (i.e. summer rating for a summer peaking system and winter rating for a winter peaking system).
[4] 2014/2015 forecasted peak demand.

System	Feeder #[1,2]	Voltage (kV)	Conductor Rating (kVA) [3]	Peak Demand (kVA)[4]	Feeder Loading vs. Conductor Rating Capacity
Fleur de Lys	L2	7.20	2,282	187	8%
Farewell Head	L1	24.94	34,558	6,754	20%
Farewell Head	L3	4.16	2,284	340	15%
Farewell Head	L4*	12.47	8,078	1,921	24%
Farewell Head	L5	12.47	10,648	2,186	21%
Farewell Head	L6*	12.47	8,078	2,616	32%
Francois	L1	4.16	2,284	298	13%
Grandy Brook	L1	24.94	21,296	5,103	24%
Grandy Brook	L2	4.16	3,552	1,479	42%
Grandy Brook	L3	4.16	4,114	1,619	39%
Grandy Brook	L4	4.16	4,114	684	17%
Grandy Brook	L5	14.40	11,952	160	1%
Glenburnie	L1	12.47	10,648	1,428	13%
Glenburnie	L2	12.47	10,648	1,021	10%
Grey River	L1	4.16	1,535	197	13%
Hawke's Bay	L1	12.47	4,601	1,328	29%
Hawke's Bay	L3	12.47	12,311	6,207	50%
Hampden	L1	12.47	4,233	1,441	34%
Jackson's Arm	L1*	12.47	5,227	602	12%
Jackson's Arm	L2	12.47	4,601	692	15%
King's Point	L1	24.94	9,201	2,109	23%
King's Point	L2	7.20	2,174	200	9%
Little Bay Islands	L1	4.16	2,284	233	10%

System	Feeder #[1,2]	Voltage (kV)	Conductor Rating (kVA) [3]	Peak Demand (kVA)[4]	Feeder Loading vs. Conductor Rating Capacity
Little Bay	L1	24.94	9,129	605	7%
Little Bay	L2	12.47	4,565	190	4%
Main Brook	L1	4.16	2,284	593	26%
Main Brook	L2	7.20	3,953	154	4%
McCallum	L1	12.47	4,233	179	4%
Monkstown	L1	14.40	4,565	315	7%
Monkstown	L2	7.20	1,534	220	14%
Petite Forte	L1	14.40	4,565	150	3%
Petite Forte	L2	7.20	2,282	136	6%
Parson's Pond	L1	12.47	6,847	862	13%
Plum Point	L1	12.47	10,648	1,422	13%
Plum Point	L2	12.47	10,648	3,012	28%
Ramea	L1	4.16	3,149	724	23%
Ramea	L2	4.16	3,149	414	13%
Rocky Harbour	L1	12.47	10,648	2,773	26%
Rocky Harbour	L2	12.47	10,648	1,721	16%
Roddickton	L1	12.47	6,847	1,808	26%
Roddickton	L3	12.47	6,847	466	7%
Roddickton	L4*	12.47	10,648	2,334	22%
St. Brendan's	L1	4.16	2,284	355	16%
Sally's Cove	L1	7.20	2,282	63	3%
South Brook	L1	24.94	9,201	1,948	21%
South Brook	L2	7.20	4,601	424	9%

System	Feeder #[1,2]	Voltage (kV)	Conductor Rating (kVA) [3]	Peak Demand (kVA)[4]	Feeder Loading vs. Conductor Rating Capacity
South Brook	L3	4.16	1,412	1,025	73%
South Brook	L4	7.20	10,649	1,205	11%
South Brook	L5	12.47	17,279	2,699	16%
South Brook	L6	7.20	2,282	29	1%
South Brook	L7	12.47	12,333	5,432	44%
St. Anthony	L1	24.94	21,296	3,595	17%
St. Anthony	L2*	24.94	21,296	2,600	12%
St. Anthony	L3	24.94	24,666	6,195	25%
St. Anthony	L6	12.47	3,067	481	16%
St. Anthony	L7	12.47	10,648	465	4%
St. Anthony	L8	7.20	3,550	495	14%
Wiltondale	L1	12.47	6,847	76	1%
Westport	L1	14.40	14,198	763	5%
Westport	L2	7.20	3,067	506	17%