INFORMATION AND DISCUSSION ON PLANNING THE TRANSMISSION SYSTEM

TRANSMISSION SYSTEM DEVELOPMENT PLAN FOR THE ISLAND OF MONTRÉAL

Montréal, November 4, 2016
CURRENT SITUATION

- Population density
- Load for island of Montréal
- Distribution and transmission voltages

CONVERSION TO 315 kV

- Why?
- Achievements

PROJECTS

- Under way
- Under analysis

DEVELOPMENT PLAN

DISCUSSION
TRANSMISSION SYSTEM DEVELOPMENT PLAN FOR THE ISLAND OF MONTRÉAL

- Current situation
Legend:
- 735 kV
- 315 kV
- 120 kV
- 69 kV
Over 2 million people live on the island of Montréal

The island of Montréal has an area of 483 km²

Households are concentrated downtown

Space is limited for new substations and power lines
Island of Montréal load ≈ 25% of the province’s total load

4000 MW around 1955
¼ = 1000 MW island of Montréal
CURRENT SITUATION
ISLAND OF MONTRÉAL LOAD
CURRENT SITUATION

REVIEW OF CURRENT ISLAND OF MONTRÉAL SUPPLY

315 kV available on the Island of Montréal
The 120-kV backbone, built mostly in the 50s and 60s: in service for about 75 years
The island of Montréal power system consists of 34 facilities:

- One strategic substation (735/315-kV)
- Seven source substations (315/120-kV or 120/69-kV)
- 32 satellite substations (315/25-kV, 120/25/12-kV, 120/12-kV or 69/12-kV)
- One 315-kV switching substation

23 120/12-kV satellite substations were built in the 50s and 60s

Four source substations were built before 1970
The distribution system on the Island of Montréal operates at two voltages: 12 kV and 25 kV.

Hydro-Québec Distribution’s goal is to convert its Montréal power system to 25 kV.

Conversion of the city of Québec’s 12-kV system was completed in 2016. Only Montréal and a few exceptions remain to be converted.
TRANSMISSION SYSTEM DEVELOPMENT PLAN FOR THE ISLAND OF MONTRÉAL

- Corporate objective: Deploy 315 kV
NEED FOR A CORPORATE OBJECTIVE – PLANNING CYCLE

Reliability

Power system

Planning

Power supply quality

Reduction of 12-kV coverage

Aging equipment

Increasing load
The 120-kV substations were designed for load densities from 1 to 5 MVA/km²

The 315-kV substations were designed for load densities over 5 MVA/km²

In 2015, density was 14.3 MVA/km²

Equipment at end of service life

Long-term growth in demand (increased population density)

HQ must ensure quality and continuity of service

Strategic direction set in 2010
Review underway of the development plan for the island of Montréal
2010 corporate decision to convert the island of Montréal to 315 kV

- Greater supply capacity
- Less equipment
- Fewer losses: $10 to 30 million less (discounted over 40 years) per substation

About 1900 MVA of capacity per double circuit

120 kV

About 400 MVA of capacity per double circuit

315 kV
Example of a 120-kV line in Montréal
TRANSMISSION SYSTEM DEVELOPMENT PLAN FOR THE ISLAND OF MONTRÉAL

- Projects
ACCOMPLISHMENTS SINCE OPTING TO CONVERT TO 315 KV

- Conversion
  1. Bout-de-l’Île *
  2. Saraguay
  3. Bélanger
  4. Charland
  5. Henri-Bourassa
  6. Fleury
  7. De Lorimier
  8. St-Patrick
  9. St-Jean → Underway…

*major 315-kV investments

All projects approved by the Régie de l’énergie
Next 315/25-kV substations:

- Montréal-Nord
- Lachine (to replace Dorval) *new substation*
- Hochelaga *new substation*
- Bout-de-l’Île
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Discussion