Hydro-Québec TransÉnergie ensures transmission grid reliability and generation/load balancing at all times. A team draws up an integrated schedule that is used to plan, for each hour of the day ahead, the output from the major reservoir generating stations according to energy needs, taking into account capacity limits on the main transmission corridors, equipment outages and interchanges with neighboring systems.

**Supporting complex management**

With the integration of wind energy and the growth in exports, managing the generating fleet has become increasingly complex. The aim is to synchronize the availability of the required power and energy with transmission capabilities. RALPH makes it possible to simulate short-term dispatching of generation output. It presents a model of the transmission system for purposes of balancing generation and load. The application offers the possibility of configuring a multitude of parameters in order to apply specific generation strategies based on generating facility characteristics while staying within the constraints of the transmission system.

**Characteristics of generating facilities**

RALPH uses a mathematical optimization approach to the dispatching of output from reservoir generating stations built on water systems. The application is based on an optimization model that takes into account the characteristics of the generating units in each power station (Hydro Unit Commitment). RALPH is destined to become a standard in the operation of a generating fleet over a 24-hour forecasting horizon.
Main advantages

For each generating station, RALPH determines the units committed and their output for each hour of the day ahead. This approach makes it possible to

- observe operating constraints
- closely follow the generating strategy developed by Hydro-Québec Production
- control efficiency deviations and unit startups and shutdowns

RALPH takes several parameters into account:

- Availability of generating facilities (breakdowns, restrictions, etc.)
- Reservoir filling rates (initial levels, operating levels, fluctuations in flow rates, etc.)
- Transmission system status (losses, capacity limits, etc.)
- Energy interchanges with neighboring systems

For information

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