

1 Q. Please provide details of Hydro's planning process. For example, at what intervals
2 prior to the operating day does Hydro prepare demand/supply schedules and what
3 is included in the schedules; i.e., real-time, day-ahead, week ahead, season ahead,
4 etc., demand forecast, available generation, transmission outages, etc.

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7 A. Hydro maintains a high level of oversight in the planning and operation of the
8 power system to ensure a reliable supply to customers. It carries this out under a
9 number of different time horizons with appropriate levels of computer applications
10 to support decision making. The models vary somewhat between generation and
11 transmission equipment and are therefore described separately below.

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13 Generation and Demand Supply

14 The hourly demands for the power system for the next seven days are produced
15 daily by a computer application based on a seven day hourly weather forecast. The
16 hourly demand forecast for the current day is updated at fixed times during the day
17 based on recent demand measurements and updated weather forecasts.

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19 On a real time basis, the Energy Control Centre (ECC) monitors the hourly demand
20 forecast and dispatches generation to reliably and economically meet the demand.

21 The ECC monitors the available generation and logs if there is any generation that
22 becomes unavailable. A unit commitment program is used by the ECC to provide
23 recommendations to the operator on how the available hydroelectric units can
24 make the most efficient use of the water resources given the hourly demand
25 forecast and the current generation guidelines described below. The ECC will
26 implement these recommendations in real time by starting and shutting down

1 hydroelectric units to ensure maximum benefit of the water while ensuring
2 required operating reserves.

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4 On a short term basis (daily and weekly), weather forecasts and the seven day
5 hourly load forecast are reviewed to determine the requirements for Holyhood
6 dispatch to ensure the appropriate number of units are online to meet the n-1
7 contingency reliability criteria.

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9 On a weekly basis and as required during the week, guidelines are developed for
10 the ECC on when and at what level of output to dispatch the hydroelectric units.
11 The water management application, Vista, provides recommendations on how the
12 units should be dispatched based on existing water levels, inflows into the
13 reservoirs and the weather forecast. These recommendations are reviewed by
14 System Operations personnel to determine the most efficient use of the water
15 resources while meeting reliability requirements and to develop the guideline
16 provided to the ECC.

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18 On an annual basis, Hydro prepares a Generation Outage Schedule to ensure a
19 secure generation supply. It is revised periodically as system conditions (customer
20 demand and hydrological conditions), outage requirements and generation and
21 transmission equipment availability change. The Generation Outage Schedule
22 outlines the generating units (Hydroelectric and Thermal) annual planned
23 maintenance outage times by duration and time of year. It is established in an
24 iterative approach involving the System Operations department, capital project
25 managers and plant maintenance planning departments. It is developed using the
26 latest available monthly operating peak demand forecast to ensure the generation
27 supply N-1 reliability criterion is met.

1 Transmission

2 On a real time basis, transmission related outages are reviewed for reliability, using
3 the load flow application on the Energy Management System (EMS) before final
4 approval is given by the ECC. The load flow application is used to ensure that
5 required voltage levels are maintained to reliably supply power to customers.

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7 For daily and weekly planning, Hydro uses a planned outage database to approve
8 and schedule transmission and generation equipment outages before they go to the
9 ECC for final approval and implementation. Outage requests are submitted in
10 advance within required timelines established depending on complexity and
11 customer involvement. Day shift personnel in the System Operations department
12 review the outage requests and ensure all reliability requirements are met and any
13 affected customers (i.e. Newfoundland Power, Industrial) are involved to ensure all
14 requirements are understood and communicated in advance of the equipment
15 being removed from service.

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17 On an annual basis, Hydro prepares a Master Outage Schedule. The Master Outage
18 Schedule outlines the maintenance outage requirements for the transmission
19 system including any required capital project work. This list is reviewed by the
20 System Operations department, regional planners, Newfoundland Power and
21 Industrial Customers to establish recommended outage times for each piece of
22 equipment to maximize system reliability and minimize customer impact. These
23 recommended outage times are used for work planning and scheduling by each of
24 the plants and regions as well as capital project managers.