

1 Q. R. Henderson's Testimony

2 1. With reference to Schedule 1, what is the firm energy capability of
3 each of the plants?

4 2. Indicate the basis for firm energy determinations for each hydroelectric
5 plant (including each NUG), and the overall probability distribution for
6 the range of hydraulic generation that Hydro could experience based
7 on available information. Indicate the extent to which firm hydraulic
8 generation estimates have changed since 1992.

9 3. For reliability purposes, what firm energy estimates are used for
10 combustion turbine and diesel generation plants in Schedule 1?

11 4. Reference page 5, lines 24 and 25, what are the "long standing
12 arrangements to buy energy"?

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15 A. 1. Please refer to Schedule IX of H. G. Budgell's testimony for the firm
16 annual energy capability of each of Hydro's generating plants.

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18 2. Firm energy for hydroelectric plants can be determined in different
19 manners. It is generally the annual production which the facility can
20 maintain under the most onerous hydrological conditions as
21 determined by simulations. For the Bay d'Espoir system which
22 includes the Upper Salmon plant the firm energy is determined by
23 means of simulation of the operation of the plants in the system using
24 a computer model. In the model the load is increased on the system
25 to the point where it is no longer able to meet the load under the
26 lowest inflow conditions. The maximum annual energy that the
27 system can meet as a result of this exercise represents the simulated
28 firm energy. The firm energy from Cat Arm and Hinds Lake were

1 taken from the results of similar simulations done for the feasibility
2 studies for those projects. The firm energy from the NUG's was that
3 amount provided in their project proposal.

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5 Firm energy estimates are revised from time to time to reflect the
6 impact of operating experience on conversion factors versus those
7 used in the simulation. As well, application of the "definition of firm"
8 may impact on firm energy capabilities.

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10 The table below shows the annual firm energy estimates by plant for
11 the period 1992-2000 inclusive. Of note, Upper Salmon's firm energy
12 capability changed from 420 GWh in 1996 to 474 GWh in 1997. This
13 is primarily due to a change in the firm definition. The new figure was
14 based on the same firm water cycle used for Bay d'Espoir.

Annual Firm Energy Capability by Plant (GWh)

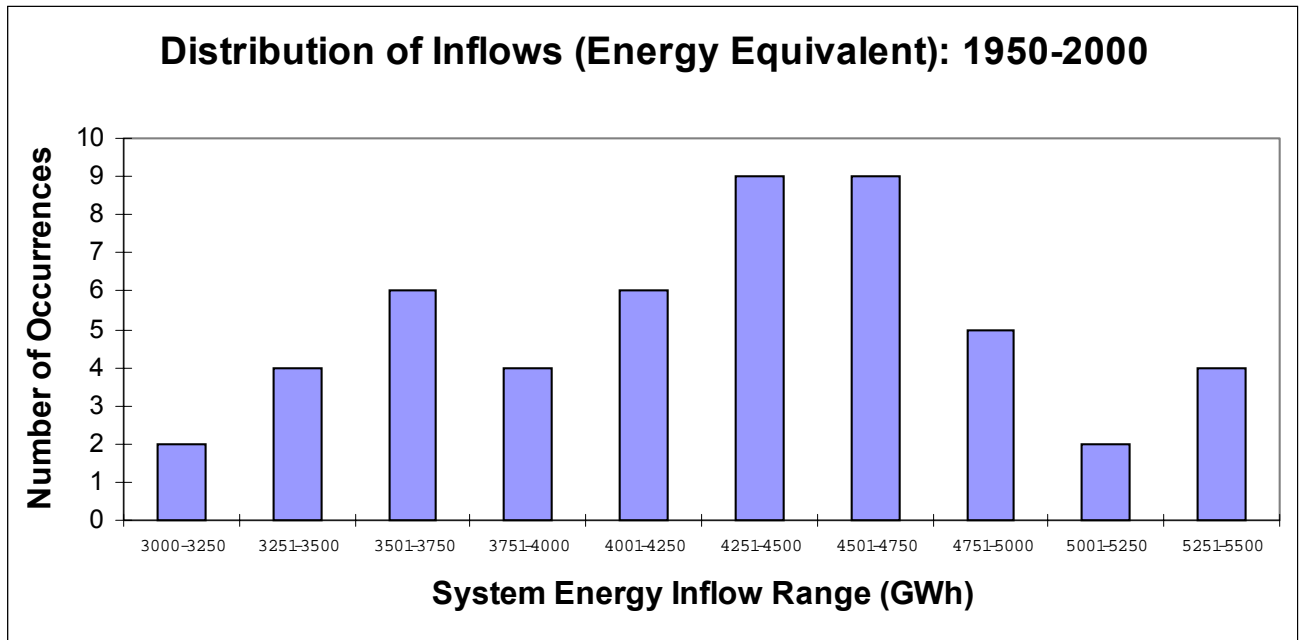
Year	Bay D'Espoir	Upper Salmon	Hinds Lake	Cat Arm	Paradise River	NLH Mini-Hydro's*	NUGs	Total Firm
1992	2211	418	287	617	26	5	N/A	3564
1993	2211	418	287	617	26	5	N/A	3564
1994	2211	418	287	617	26	5	N/A	3564
1995	2211	418	287	617	26	5	N/A	3564
1996	2216	420	286	613	27	5	N/A	3567
1997	2226	474	286	613	27	5	N/A	3631
1998	2234	476	283	605	27	5	N/A	3630
1999	2234	476	283	605	27	5	107	3737
2000	2234	476	283	605	27	5	107	3737

17 * Snook's Arm, Venam's Bight, and Roddickton Mini-Hydro.

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19 The graph below shows the distribution of inflows (converted to an
20 energy value) for Hydro's 50 years of hydrological records for all of
21 Hydro's large plants, Bay d'Espoir, Upper Salmon, Hinds Lake and

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Cat Arm. This does not give the hydraulic production but is representative of the variation in production.



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- 3. Hydro forecasts no firm energy capability for its combustion turbine and diesel generation plants.
- 4. Please refer to the response to IC-43.