

**Hydro Plants Facility Rehabilitation (\$2,345,000)**

**Q. On p. 11 of Mr. Ludlow's evidence dated October 28, 2002, reference is made to the combined annual production of hydro plants of approximately 426 GWhs. Provide the following information:**

- a) Have there been any spillages of water from Newfoundland Power's hydroelectric sites over the last 10 years?**
- b) If the answer to (a) is yes, at which locations did they occur and what was the volume of water that was actually spilled and what was the duration of the spill?**
  - What was the dollar value of the water that was spilled based on the marginal cost of fuel consumed at Holyrood, in each of those years?**
  - What corrective action was considered to increase the height of the dam or other alternatives at the various hydro plants in order to minimize such spilling?**
  - Was a cost benefit analysis completed to determine the cost effectiveness of any possible corrective action compared with the value of water actually spilled (costed at the marginal cost of fuel at Holyrood)?**

**A. a) Yes. There have been spillages over the past 10 years.**

- b) Newfoundland Power calculates spill using water level data (acquired manually or via telemetry) and spillway rating curves. At remote spillways (other than forebays and other reservoirs with water level monitoring) spill records are not considered reliable. The attached tables provide Newfoundland Power's last 10 years of spill records for its 19 hydroelectric watersheds by development and by year. Attachment A provides this information in terms of volume of water spilled, measured in millions of cubic meters. Attachment B provides the same information in terms of energy equivalent, expressed in MWh. Attachment B also provides the total annual recorded system spill expressed in dollars using the current short run marginal cost of energy at Holyrood (4.66 cents per kWh).**

The Company has reviewed the design of many of its hydraulic structures in advance of major reconstruction projects and as part of strategic planning studies of its hydroelectric system operation. In general, when the Company's plants were built, they were done so for operation as the sole source of local generation as the integrated island grid did not exist at that time. In most cases a review of optimal storage volumes considering the role of these plants today reveals that excess storage is present. Cost benefit analyses are normally conducted when major reconstruction of the hydraulic structures associated with a storage reservoir are required.

**Table 1**  
**Spill Volume by Year**  
(millions of cubic meters)

<b>Plant</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>Avg.</b>
Petty Harbour	7.7	2.7	5.3	17.2	5.5	0.3	87.0	78.3	5.3	14.7	22.4
Pierre's Brook	4.4	2.5	6.6	5.5	0.2	1.1	0.0	7.6	0.2	16.3	4.4
Mobile / Morris	0.0	0.0	0.1	0.0	0.0	0.0	0.0	12.1	0.0	0.0	1.2
Tors Cove / Rocky Pond	0.0	0.0	1.1	4.8	33.7	0.1	5.0	2.5	19.4	0.8	6.7
Cape Broyle / Horse Chops	2.4	0.3	1.1	0.5	0.0	33.8	2.4	16.0	10.4	4.2	7.1
Rattling Brook	0.0	4.3	10.6	8.9	0.0	18.2	33.1	0.0	0.0	19.0	9.4
Sandy Brook	54.3	116.9	83.2	73.0	2.0	76.1	111.9	39.3	58.6	104.8	72.0
Topsail	16.0	5.3	1.6	13.5	20.4	23.3	1.0	4.9	0.6	10.3	9.7
Seal Cove	5.3	3.0	11.3	9.9	0.8	0.1	1.9	7.1	8.5	6.0	5.4
Heart's Content	0.7	0.3	4.3	2.1	11.5	0.0	3.4	10.1	5.9	11.7	5.0
New Chelsea / Pitman's Pond	0.0	0.0	0.0	1.6	0.1	0.0	0.9	0.0	0.0	0.0	0.3
Victoria	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Lockston	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Port Union	0.0	0.0	0.0	0.0	5.8	13.1	21.5	9.9	9.3	40.8	10.0
Lookout Brook	13.3	3.1	1.9	0.1	1.7	9.5	4.5	6.1	4.7	1.3	4.6
Rose Blanche	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21.9	24.5	23.2
Burin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	12.3	10.8	3.4
<b>Total</b>	<b>103.9</b>	<b>138.4</b>	<b>128.0</b>	<b>137.1</b>	<b>81.8</b>	<b>175.5</b>	<b>272.6</b>	<b>205.1</b>	<b>157.1</b>	<b>265.1</b>	<b>166.5</b>

**Table 1**  
**Spill Energy by Year**  
**(MWh)**

<b>Plant</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>Avg.</b>
Petty Harbour	1,064	370	743	2,385	770	40	12,080	10,869	733	2,040	3,109
Pierre's Brook	805	465	1,223	1,009	40	210	0	1,411	34	3,011	821
Mobile / Morris	0	0	8	0	0	0	0	3,329	0	0	334
Tors Cove / Rocky Pond	0	0	121	550	3,835	6	565	279	2,204	89	765
Cape Broyle / Horse Chops	305	35	136	69	0	4,304	305	2,042	1,329	535	906
Rattling Brook	0	868	2,125	1,788	0	3,661	6,651	0	0	3,806	1,890
Sandy Brook	4,444	9,567	6,808	5,972	161	6,228	9,155	3,217	4,798	8,574	5,892
Topsail	3,453	1,155	353	2,922	4,420	5,039	221	1,062	131	2,229	2,098
Seal Cove	590	336	1,261	1,110	90	10	214	797	951	673	603
Heart's Content	68	32	442	211	1,175	0	347	1,027	605	1,187	509
New Chelsea / Pitman's Pond	0	0	0	290	15	0	174	0	0	0	48
Victoria	0	0	124	0	0	0	0	0	0	0	12
Lockston	0	0	0	0	0	0	0	58	0	0	6
Port Union	0	0	0	0	242	542	890	410	384	1,691	416
Lookout Brook	4,770	1,111	680	50	594	3,408	1,627	2,198	1,680	483	1,660
Rose Blanche	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5,509	6,160	5,835
Burin	0	0	0	0	0	0	0	323	366	319	101
<b>Total (MWh)</b>	<b>15,499</b>	<b>13,939</b>	<b>14,023</b>	<b>16,356</b>	<b>11,342</b>	<b>23,448</b>	<b>32,229</b>	<b>27,022</b>	<b>18,724</b>	<b>30,797</b>	<b>20,338</b>
<b>Value (\$000s)</b>	<b>722</b>	<b>650</b>	<b>653</b>	<b>762</b>	<b>529</b>	<b>1,093</b>	<b>1,502</b>	<b>1,259</b>	<b>873</b>	<b>1,435</b>	<b>948</b>