

1 Q. **Impacts re: Interconnections of Isolated Rural Systems to Island**
2 **Interconnected System**

3
4 6. In 1995, the Board recommended “that the prudence of costs associated
5 with the St. Anthony/Roddickton interconnection be reviewed at the next
6 Hydro rate referral, following the interconnection, for the purpose of
7 determining recoverable costs.” Provide all evidence available to Hydro
8 as to why this interconnection was undertaken, and that the costs were
9 prudently incurred and in the best interest of customers on the Island
10 Interconnected System.

11
12
13 A. 6. The report entitled “Great Northern Peninsula Interconnection Study”
14 dated October 18, 1993 (attached to IC-203(5)) reviewed several
15 interconnection alternatives. The report determined that while technically
16 viable, the interconnection did not meet the minimum economic guideline
17 applied by Hydro Management when approving interconnection projects.

18
19 However, early in 1994 the Canada/Newfoundland Infrastructure Initiative
20 was announced and Hydro applied for and was granted \$5.0 million to be
21 applied toward the interconnection of St. Anthony/Roddickton system.
22 Analysis indicated that this funding improved the economics of the
23 proposed interconnection and a decision was made to proceed.

24
25 The interconnection scheme approved was very similar to interconnection
26 alternative #4 – 138 kV Bear Cove to St. Anthony Airport as outlined in
27 the October 18, 1993 report, with the following changes:

1 The in-service date had been moved from 1998 to 1996 in order to take
2 advantage of funding under the Infrastructure Agreement;

3

- 4 • The Hawke's Bay diesels were to be relocated to the Roddickton
5 Woodchip Plant;
- 6 • The Roddickton woodchip fired thermal generating station was to be
7 modified to burn #2 fuel oil and placed on standby; and
- 8 • Switched shunt reactors and capacitors were to be used for voltage
9 control instead of static var compensators.

10

11 Subsequent to project approval, the following changes were made to the
12 interconnection concept:

13

- 14 • It was decided to leave the diesel units at Hawke's Bay and not
15 relocate them to Roddickton; and
- 16 • It was decided not to convert the Roddickton Woodchip Plant to an oil
17 fired operation.

18

19 The interconnection alternative approved had an estimated capital cost of
20 \$38.4 million or a net cost of \$33.4 million including the \$5.0 million
21 Infrastructure grant. A cost effectiveness analysis, which incorporated the
22 Infrastructure grant as well as revised load forecasts, was completed. The
23 revised load forecasts, fuel series and Holyrood incremental energy rates
24 are shown in Schedule 1-3 respectively. The following table summarizes
25 the results of the analysis and copies of the complete cost effectiveness
26 analysis are attached.

SUMMARY OF COST EFFECTIVE ANALYSIS (1993\$ X 1000)			
Cumulative Present Worth to 2022		Present Worth Difference at 2011	Payback Period Years
Isolated Alternative	Interconnected Alternative		
88001	73769	-4020	12

1 Given that the payback period is less than Hydro's minimum economic
2 guideline that interconnection projects must have payback periods not
3 exceeding 15 years, the decision was made to proceed with the project. The
4 project, when completed, cost approximately \$31.4 million and with the \$5.0
5 million infrastructure grant resulted in a net cost of \$26.4 million.

**SCHEDULE 1
GNP INTERCONNECTION ANALYSIS
LOAD FORECASTS**

REVISED MAY 1994

Year	St. Anthony/Roddickton System				Existing GNP System Forecast	
	Isolated Forecast		Interconnected Forecast		(kW)	(MWh)
	(kW)	(MWh)	(kW)	(MWh)		
1994	11263	51412	-	-	26791	112545
1995	11539	51922	-	-	27999	117812
1996	11640	52360	-	-	28586	120272
1997	11742	52808	11348	49209	29149	122624
1998	11845	53257	12676	54687	29696	124920
1999	11941	53673	13535	58097	30249	127234
2000	12037	54090	14064	60370	30740	129295
2001	12140	56222	14596	63930	31208	131260
2002	12257	56751	15050	65920	31689	133279
2003	12371	57267	15399	67447	32159	135255
2004	12517	57926	15705	68786	32605	137131
2005	12665	58591	16016	70152	32986	138735
2006	12832	59348	16285	71328	33365	140342
2007	13002	60112	16555	72513	33705	141780
2008	13163	60838	16790	73540	34008	143055
2009	13295	61432	17002	74471	34339	144452
2010	13438	62078	17225	75446	34682	145898
2011	13590	62767	17457	76460	35004	147259
2012	13739	63436	17678	77430	35296	148496
2013	13871	64033	17877	78299	35581	149696
2014	13971	64484	18058	79092	35866	150901
2015	14082	64984	18244	79908	36132	152021
2016	14203	65532	18436	80751	36398	153138
2017	14309	66010	18604	81483	36673	154300
2018	14400	66419	18747	82111	36938	155418
2019	14497	66855	18901	82784	37177	156423
2020	14603	67334	19059	83480	37404	157378
2021	14697	67760	19200	84096	37642	158384
2022	14777	68119	19319	84617	37882	159394

Note: Existing GNP system forecasts include existing loads from Bonne Bay to the Flower's Cove area.

**SCHEDULE 2
 GNP INTERCONNECTION ANALYSIS
 FUEL SERIES**

REVISED APRIL 1994

Year	Residual Fuel \$/BBL	Diesel Fuel \$/L	Wood Fuel \$/Tonne
1993	15.4	0.198	29.21
1994	13.8	0.190	29.21
1995	14.0	0.201	29.21
1996	15.2	0.216	29.21
1997	16.4	0.232	32.11
1998	17.6	0.247	32.11
1999	18.9	0.262	32.11
2000	20.2	0.278	32.11
2001	21.8	0.298	36.12
2002	22.5	0.304	36.12
2003	23.1	0.308	36.12
2004	23.9	0.315	36.12
2005	24.3	0.322	40.36
2006	24.8	0.328	40.36
2007	25.3	0.335	40.36
2008	25.8	0.342	40.36
2009	26.3	0.348	45.04
2010	26.9	0.355	45.04
2011	27.4	0.363	45.04
2012	28.2	0.369	45.04
2013	29.8	0.376	49.58
2014	30.6	0.384	49.58
2015	31.6	0.392	49.58
2016	32.5	0.400	49.58
2017	33.5	0.408	54.55
2018	34.4	0.416	54.55
2019	35.3	0.423	54.55
2020	36.3	0.432	54.55
2021	37.2	0.440	60.01
2022	38.2	0.449	60.01

**SCHEDULE 3
GNP INTERCONNECTION ANALYSIS
HOLYROOD INCREMENTAL ENERGY RATES**

REVISED APRIL 1994

Year	Energy Rate \$/kWh
1997	0.0271
1998	0.0291
1999	0.0312
2000	0.0334
2001	0.0360
2002	0.0372
2003	0.0382
2004	0.0395
2005	0.0402
2006	0.0410
2007	0.0418
2008	0.0426
2009	0.0435
2010	0.0445
2011	0.0453
2012	0.0466
2013	0.0493
2014	0.0506
2015	0.0522
2016	0.0537
2017	0.0554
2018	0.0569
2019	0.0583
2020	0.0600
2021	0.0615
2022	0.0631

Note: Assumes a Holyrood efficiency of 605 kWh/Barrel