

REFERENCE 10

NEWFOUNDLAND AND LABRADOR
REPORT ON
1985/86 CLIMATOLOGICAL MONITORING
PROGRAM

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MAPS I & II

1.0 SUMMARY

The climatological study concluded on 1986-05-31 was the ninth in an annual series conducted by Newfoundland and Labrador Hydro.

The study included the accumulation of data related to wind and direction, ice accumulation on passive collectors.

This report summarized the data collected during the period of 1985-06-01 to 1986-05-03 and recommends the following:

- 1) The continuation of the Passive Ice Meter Program
- 2) Wind Data continued to be collected at Hawkes Bay only.
- 3) The test towers to be monitored from November 1985 to May 1986 on the Long Range Mountains only.

2.0 OBJECTIVES

The "Report on 85/86 Climatological Monitoring Program" will review the individual components of the study funded under Hydro Work Order 6027 and backcharged to the L.C.D.C. Feasibility Program (W.O. 6801).

All the data collected during the 85/86 observation period will be presented.

Conclusions will be drawn based on the accumulated data and recommendations will be made as to the future direction of the program.

3.0 INTRODUCTION

The 1985/86 Climatological Monitoring Program incorporated two (2) programs designed to collect raw data with a goal to optimize transmission line design and route selection parameters for the HVDC Line.

The Passive Ice Meter and Test Tower Sites provide data related to icing conditions, that affect the HVDC transmission line, from Labrador to Soldier's Pond and in particular at selected locations along the proposed HVDC Line routes.

The anemometer Site at Hawke's Bay provides data related to another design parameter of transmission lines: wind speed, direction and peak gust conditions.

This report presents the summarized data collected from June 1985 to May 1986.

4.0 DISCUSSION OF PROGRAM

4.1 PASSIVE ICE METER 3

May 15, 1986 marked the completion of the ninth successful Passive Ice Meter (PIM) observation period. Observer co-operation was good at most sites and the data reported on the daily and monthly observation sheets have been comprehensive.

Data collected from the fifteen (15) sites is tabulated in Appendix I Summary of Ice Meter Data.

In general, the information documented during the 1985/86 season showed similar ice accretion to previous years. The nine years data will now provide a good base for an icing profile for the province.

4.2 ANEMOMETER 2

For 1985/86, wind data was only collected at Hawke's Bay. This site which is manned, has operated successfully since 1971.

4.3 TEST TOWER SITES

The Test Tower Program for the 1985/86 season began in mid December 1985, with visits to Long Range Mountain Crossing area. The winter was fairly mild with no substantial accumulations observed.

All sites were visited as regularly as weather would permit and the collected data is tabulated in Appendix 6.3 - Summary of Test Tower Data.

4.3 TEST TOWER SITES (cont'd)

As recommended in the 1984/85, some existing towers were relocated in 1985 to the actual line routes, to see the difference in ice accumulation from exposed areas to sheltered areas. Although the ice accumulations for 1985/86 were relatively small, the difference in ice accretion from the actual line route to exposed test tower sites was dramatic. In most cases, the test towers on exposed sites would have large accumulations while the test towers on the sheltered line routes were bare. The site locations of the test towers are shown on Maps I and II. Summary of Test Tower Data.

4.4 TEST SPANS

During January 1986 vandals struck the test span at Inner Pond toppling one of the towers. The remaining tower is now being monitored as a test tower. The test span at Brian's Pond remained intact and was visited regularly as a passive collector.

5.0 CONCLUSIONS AND RECOMMENDATIONS

With the completion of the 1985/86 Climatological Data Collection Program another year of ice and wind information has been added to the existing data base established to enhance the HVDC Transmission Line Design Parameters and Route Selection.

It is recommended that the Climatological Program continue for 1986/87 with scope of the Program to be as follows:

- 1) Maintain PIM Program ? *Passive ice meter*
- 2) Maintain wind data collection at Hawkes Bay only. ?
- 3) Continue the monitoring of the test towers and test span (Passive) along the Long Range Mountains area only.

- 6.1 SUMMARY OF PASSIVE ICE METER DATA
- 6.2 SUMMARY OF ANEOMETER DATA
- 6.3 SUMMARY OF TEST TOWER DATA

APPENDIX 6.1
SUMMARY OF PASSIVE ICE
METER DATA

APPENDIX 6.2

SUMMARY OF ANEMOMETER DATA

ABSTRACT OF THE WINDSUMMARY - HAWKES BAY

	JUNE 85	JULY 85	AUG. 85	SEPT. 85	OCT. 85	NOV. 85	DEC. 85	JAN. 86	FEB. 86	MAR. 86	APR. 86	MAY 86
Total Mileage for Month	7118	8900	6214	7583	9894	10189	12719	13122	8819	11760	9421	9123
Greatest Mileage in 24 Hrs.	395	588	414	676	740	538	942	774	690	728	716	468
Greatest Mileage & Prevailing Dir. for 1 Hr.	28 SW	32 SW	24 SW	36 NW	38 SW	32 W&E	48 W	60 SW	50 E	42 SW	38 SW/E	28 SW
Date of Greatest Mileage for 1 Hr.	30TH	27TH	25TH	29TH	17TH	7,9,10; and 28TH.	16TH	14TH	26TH	20TH	2ND 10TH	4TH
Average Speed for Month (mph)	9.9	12.0	8.4	10.7	13.3	14.2	17.2	17.6	13.1	15.8	13.1	12.3
Longest Continued - Direction	SW	SW	NW	SW	NW	NE	W	SW	W	SW	E	NE
- Hours	21	94	54	33	49	33	46	40	37	31	46	26
Prevailing Direction - By Mileage	W 1684	SW 6038	E 1373	SW 2213	SW 3832	W 2941	W 5515	SW 5072	SW 2700	SW 6112	E 3631	SW 2596
- By Total Hrs.	E 147	SW 369	E 176	SW 155	SW 208	NW 165	W 225	SW 225	SW 184	SW 329	E 256	SW 176
Peak Gust (mph)	SW 34	SW 48	NW 28	NW 44	SW 45	W 41	W 62	SW 78	SW 63	SW 62	E 48	SW 39

NOTE: Instrument records in imperial units.

SUMMARY OF PASSIVE ICE METER DATA1985 - 1986

LOCATION		OCTOBER 85	NOVEMBER 85	DECEMBER 85	JANUARY 86	FEBRUARY 86	MARCH 86	APRIL 86	MAY 86
WABUSH	S01	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
CHURCHILL FALLS	S02	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
GOOSE BAY	S04	nil	Trace of Glaze - 1 day	nil	0.2 cm Freezing Drizzle - 1 day	Trace of Glaze - 2 days	0.1 - 0.3 of Glaze & Wet Snow - 1 day	0.1 - 0.3 cm Glaze - 3 days	nil
POINT AMOUR	C07	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
YANKEE POINT	C09	nil	1.2 cm ice	nil	0.6 cm Glaze - 1 1.2 cm Glaze - 1 2.5 cm Glaze - 7 day day days	nil	1.3 cm Glaze - 1 day	1.3 cm Glaze - 1 day	nil
PLUM POINT	C10	nil	nil	nil	Trace of Glaze - 1 day	Trace of Rime and Icicles - 1 day	0.7 cm Rime - 1 day with icls	nil	nil
HAWKES BAY	C11	3 cm Wet Snow	nil	nil	0.3 cm Glaze on one vertical sur- face (East)	nil	nil	nil	nil
DANIEL'S HARBOUR	C12	nil	nil	nil	Trace of Glaze - 1 day	nil	nil	nil	nil
GROS MORNE NATIONAL PARK	C13	nil	0.1 cm Glaze - 2 days	nil	0.2 cm Glaze - 3 days	nil	0.1 cm Glaze - 1 day	0.2 cm Glaze - 1 day	nil
PORT-AUX-BASQUE	S16	nil	nil	0.5 cm Glaze-- 1 day	1.0 cm Glaze - 1 day	0.5 cm Glaze - 1 day	0.5 cm Glaze - 2 days	0.8 cm Glaze - 1 day	nil
BURNT POND	C17	nil	nil	nil	Trace of Glaze - 1 day	nil	nil	nil	nil

SUMMARY OF PASSIVE ICE METER DATA

1985 - 1986

LOCATION	OCTOBER 85	NOVEMBER 85	DECEMBER 85	JANUARY 86	FEBRUARY 86	MARCH 86	APRIL 86	MAY 86
BUCHANS C18	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
Torbay A/Port 34 S19	*****	*****	NOT MONITORED	*****	0.4 & 0.5 cm Glaze - 2 days	0.4-0.9 cm Glz. with 4-18 cm icicles - 7 days	nil	nil
SPRINGDALE C23	nil	nil	nil	Trace of Glaze 4 days-2cm Glz. w/icls - 1 day	0.8 to 2.6 cm Glaze - 8 days	nil	nil	nil
STONEY BROOK C24	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
GANDER AIRPORT S25	nil	nil	2-.4 cm Rime Frz Drzl - 2 days - 19 hrs. total	0.2 - 0.9 cm Glaze - 5 days	0.3 cm Glaze - 1 day	0.1 to 0.4 cm Glaze & Rime - 3 days	0.5 cm Glaze 1 day-0.8cm Rime & Wet Snow ~ 2 days	nil
BAY D'ESPOIR S27	nil	nil	nil	nil	nil	nil	nil	nil
Brigus Junction C28	*****	*****	NOT MONITORED	*****	0.6 cm Glaze - 2 days	0.3 to 2.5 cm Glaze with 6-9 cm icls - 2 days	nil	nil
WESTERN AVALON C32	*****	*****	*****	NOT MONITORED	*****	*****	*****	*****
HOLYROOD C33	nil	nil	0.3 cm Glaze - 1 day	nil	nil	0.3 cm Glaze - with icicles - 1 day.	nil	nil
HARBOUR DEEP C35	nil	nil	nil	1.0 cm Glaze - 1 day	nil	nil	3.8 cm Glaze - 2 days	nil
PORT BLANDFORD C40	nil	nil	nil	nil	nil	0.2 cm Glaze - 1 day	nil	nil

APPENDIX 6.3

SUMMARY OF TEST TOWER DATA

TABLE OF DATA

SITE BIG HILL

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	2" Rime	280
86-01-17	15	280	-10	1" Rime	280
86-03-04	10	300	- 8	Trace of Rime	-
85-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #9 LONG RANGE MOUNTAINS

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
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Tower Site Relocated to New Site 2g September 1985

TABLE OF DATA
SITE #10 MAIN RIVER

<u>DATE</u>	<u>WIND SPEED (MPH)</u>	<u>WIND DIR. (TRUE)</u>	<u>TEMP. °C</u>	<u>ACCUMULATION NOTED</u>	<u>DIRECTION OF ACCUMULATION (Deg)</u>
85-12-12	8	280	-10	Bare	-
86-01-17	15	280	-10	Bare	-
86-03-04	10	300	- 8	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #13 PARSONS POND

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	2" Rime	-
86-01-17	15	280	-10	Bare	-
86-03-04	10	300	- 8	Bare	-
86-04-17	20	045	- 1	Bare	-

TABLE OF DATA

SITE #15 PARSONS POND

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	Bare	-
86-01-17	15	280	-10	Bare	-
85-03-14	10	300	- 8	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #14a PARSONS POND

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	1 1/2" Pendant Rime	280
86-01-17	15	280	-10	Trace of Rime	-
85-03-14	10	300	- 8	Trace of Rime	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #14 PARSONS POND

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	2" Pendant Rime	280
86-01-17				<u>Not Visited</u>	
85-03-15	10	300	- 8	Trace of Rime	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA
SITE #2 PORTLAND CREEK

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12				<u>Not Visited</u>	
86-01-17	15	280	-10	1" Rime	280
85-03-15				<u>Not Visited</u>	
86-04-27	20	045	- 1	Trace of Rime	7

TABLE OF DATA

SITE #2a PORTLAND CREEK

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
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Tower Relocated to New Site 14a September 1985

TABLE OF DATA

SITE #2b PORTLAND CREEK

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	6" Pendant Glaze	280
86-01-17	15	280	-10	1/2" Rime	-
85-03-15	10	300	- 1	3" Pendant Rime	300
86-04-27	20	045	- 1	Trace of Rime	-

TABLE OF DATA

SITE #2c PORTLAND CREEK

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
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Tower Relocated to New Site 2h September 1985

TABLE OF DATA

SITE #2d PORTLAND CREEK

<u>DATE</u>	<u>WIND SPEED (MPH)</u>	<u>WIND DIR. (TRUE)</u>	<u>TEMP. °C</u>	<u>ACCUMULATION NOTED</u>	<u>DIRECTION OF ACCUMULATION (Deg)</u>
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Tower Relocated to New Site 2i September 1985

TABLE OF DATA

SITE #2e PORTLAND CREEK

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	Bare	-
86-01-17	15	280	-10	Bare	-
85-03-15	10	300	- 1	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #2g LONG RANGE MOUNTAINS

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	1 1/2" Pendent Rime	280
86-01-17				<u>Not Visited</u>	
86-03-04	10	300	- 8	Bare	
86-04-27	20	045	- 1	Bare	

TABLE OF DATA

SITE #2h LONG RANGE MOUNTAINS

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	1" Rime on Guys	280
86-01-17				<u>Not Visited</u>	
86-03-04	10	300	- 8	Trace of Rime	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

SITE #2i LONG RANGE MOUNTAINS

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	1/2" Rime of Guys	280
86-01-17	15	280	-10	Bare	-
86-03-04	10	300	- 8	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA

INNER POND

DATE	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
85-12-12	8	280	-10	1" Pendant Rime	280
86-01-17	15	280	-10	Trace of Rime	-
86-03-04	10	300	- 8	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA
SITE #19 CAT ARM

<u>DATE</u>	<u>WIND SPEED (MPH)</u>	<u>WIND DIR. (TRUE)</u>	<u>TEMP. °C</u>	<u>ACCUMULATION NOTED</u>	<u>DIRECTION OF ACCUMULATION (Deg)</u>
85-12-12	8	280	-10	Trace of Rime	-
86-01-17	15	280	-10	Bare	-
86-03-04	10	300	- 8	Bare	-
86-04-27	20	045	- 1	Bare	-

TABLE OF DATA
SITE #20 CAT ARM

	WIND SPEED (MPH)	WIND DIR. (TRUE)	TEMP. °C	ACCUMULATION NOTED	DIRECTION OF ACCUMULATION (Deg)
-12	8	280	-10	Bare	-
-17	15	280	-10	Bare	-
-04	10	300	- 8	Bare	-
-27	20	045	- 1	Bare	-