

FORCED OUTAGE RATES 2006 UPDATE

**System Planning
December 2006**



1. INTRODUCTION

The Forced Outage Rates (FOR) used as a basis for STRATEGIST modeling are derived from the Canadian Electrical Association's (CEA) Annual Report on Generation Equipment Status. This report presents statistics on the performance of generating units on an annual and on an average performance basis over a five-year period. This update is based on statistics from CEA's 2004 Report. The average performance data from January 1, 2000, through December 31, 2004, are used in the development of FOR input data into STRATEGIST. The tables containing the pertinent data to each class of generating unit discussed below are presented in Appendix A of this report.

2. HYDRAULIC UNITS

For the Hydraulic Units, the Derating Adjusted Forced Outage Rate (DAFOR) is the value used to model the FOR in STRATEGIST. DAFOR is the ratio of the equivalent forced outage time to equivalent forced outage time plus total equivalent operating time.

2.1 Existing NLH Hydraulic Units

FOR data for existing NLH hydro units are based on the actual operating history of the units. The Generating Unit Performance Report section of the Newfoundland and Labrador Hydro, 2004 Generating Equipment Status Report presents the operating experience of NLH's facilities. The weighted average value (DAFOR) is used to model the FOR in STRATEGIST.

2.2 Future NLH Hydraulic Units

Since future hydro units owned by NLH are expected to be maintained in the same manner as NLH's existing hydro units, the FOR is modeled in STRATEGIST the same as the existing NLH hydro units.

2.3 Other Hydraulic Units

The FOR for NP, DLP, AP and NUG hydraulic units are based on the Canadian average rate (DAFOR) of all reporting units in the 5 – 23 MW, or 24 – 99 MW classification, as appropriate. This data is presented in the CEA Report in Table 6.1.2.

3. THERMAL UNITS

3.1 Existing Holyrood Steam Units

The FOR for the Holyrood Steam Units are also modeled using the DAFOR. Table 6.2.2 of the CEA Report presents the Canadian average performance data

for fossil units of all fuel types. The 100 – 199 MW classification is used to represent the Holyrood units.

3.2 Combustion Turbine Units

For the Combustion Turbine Units, the Utilization Forced Outage Probability (UFOP) is the value used to model the FOR in STRATEGIST. The UFOP represents the probability that a generating unit will not be available when required. This best models the intended service of these peaking units. Table 6.3.2 of the CEA Report presents the Canadian average data for combustion turbine units. The “All Units” classification is used to model the FOR for all combustion turbines on the system.

3.3 Diesel Units

NLH stopped reporting statistics on diesel unit outages after 1986. Therefore, the last comprehensive five year statistic for Diesel Unit operating performance would be found in the 1986 CEA Report. Since the Hawke’s Bay and St. Anthony diesels operate as standby/peaking units, the average UFOP of the Hawke’s Bay units from Table 45 is used to model FOR in STRATEGIST.

3.4 Future Thermal Units

The FOR used for future thermal units are modeled the same as comparable existing units. Units in NLH’s portfolio of future alternatives that will be unique to the system (i.e. no similar unit existing on the system) are described below:

Combined Cycle Combustion Turbine: A FOR of 5% is modeled in STRATEGIST. This value is drawn from the “Holyrood Generating Station, Combined Cycle Plant Study Update”, November, 2001.

Labrador Infeed: A FOR of 0.89% is modeled in STRATEGIST based on Shawmont Report SMR – 18 – 81.

Appendix A

- Forced Outage Data from CEA Report
- Forced Outage Rate Summary & Comparison to Previous Update
- Impact of FOR changes on System LOLH
- Source Data:

NLH Hydraulic Generating Unit Five Year Data (copy from CEA Report)

FORCED OUTAGE RATES
2004
CEA ANNUAL REPORT
GENERATION EQUIPMENT STATISTICS

I. Main Hydraulic Units

<u>Unit</u>	<u>DAFOR (%)</u>
Bay D'Espoir - 1	0.25
Bay D'Espoir - 2	2.49
Bay D'Espoir - 3	0.23
Bay D'Espoir - 4	0.89
Bay D'Espoir - 5	0.29
Bay D'Espoir - 6	0.43
Bay D'Espoir - 7	0.52
Hinds Lake	1.20
Upper Salmon	1.16
Cat Arm 1	0.21
Cat Arm 2	1.09
Paradise River	1.78
Granite Canal	3.41

Source: NLH Operating Experience from 2000 - 2004.

II. Other Hydraulic Units (Existing & Future)

<u>Unit</u>	<u>DAFOR (%)</u>
5 - 23 MW	3.19
24 - 99 MW	1.58

Source: CEA Typical 2000 - 2004. Table 6.1.2

III. Fossil Fuel Units

<u>Unit</u>	<u>DAFOR (%)</u>	
Holyrood - 1,2,3	9.64	(All Fuel)

Source: CEA Typical 2000 - 2004. Table 6.2.2
100-199 MW Classification for Holyrood.

IV. Gas Turbine Units

<u>Unit</u>	<u>UFOP (%)</u>
Holyrood	10.62
Stephenville	10.62
Hardwoods	10.62
Green Hill	10.62
Salt Pond	10.62

Source: CEA Typical 2000 - 2004. Table 6.3.2
Average - All Units

V. Diesel Units

<u>Unit</u>	<u>UFOP (%)</u>
Hawke's Bay	1.18
St. Anthony	1.18

Source: NLH Operating Experience from 1982-1986. Table 45.
Taken from 1986 CEA Annual Report since NLH stopped reporting
Data after 1986.

VI. Future Thermal Units

Fossil Units:

<u>Unit</u>	<u>DAFOR (%)</u>	
150 MW Oil	9.64	(All Fuel)

Gas Turbines:

<u>Unit</u>	<u>UFOP (%)</u>
25 - 49 MW	10.62

Source: CEA Typical 2000 - 2004. Tables 6.2.2, 100-199 MW; & 6.3.2, All Units.

**FORCED OUTAGE RATES
SUMMARY SHEET**

UNIT	(I)		(II)	(III)	COMMENT
	DAFOR	UFOP	FOR	Planning	
	%	%	%	%	
Bay D'Espoir 1	0.25			0.90	Weighted Average based on Bay D'Espoir units & Hinds Lake, Upper Salmon, Cat Arm and Paradise River.
Bay D'Espoir 2	2.49			0.90	
Bay D'Espoir 3	0.23			0.90	
Bay D'Espoir 4	0.89			0.90	
Bay D'Espoir 5	0.29			0.90	
Bay D'Espoir 6	0.43			0.90	
Bay D'Espoir 7	0.52			0.90	
Hinds Lake	1.20			0.90	
Upper Salmon	1.16			0.90	
Cat Arm - 1	0.21			0.90	
Cat Arm - 2	1.09			0.90	
Paradise River	1.78			0.90	
Granite Canal	3.41			0.90	
Future Hydro	1.58			0.90	
Gas Turbine		10.62		10.62	
Holyrood	9.64			9.64	
Diesel (Standby)		1.18		1.18	
CCCT			5.00	5.00	
Lab. Infeed (Gull Is. to Sol. Pd.)			0.89	0.89	
NP Hydro				3.19	
DLP Hydro				3.19	
A/P Hydro				2.26	Weighted Average based on Gfalls & Bfalls Capacities

(I) 2006 CEA Annual Report ; Generating experience over 5 yr. period.

(II) CCCT: "Holyrood Generating Station, Combined Cycle Plant Study Update", November 2001
Labrador Infeed: Shawmont Report ; SMR - 18 - 81

(III) As used in Strategist

**FORCED OUTAGE RATES
SUMMARY & COMPARISONS**

Unit	February 2005 Update		December 2006 Update	
	CEA Statistics	As Used for Planning	CEA Statistics	As Used for Planning
Bay D'Espoir 1	0.27	0.91	0.25	0.90
Bay D'Espoir 2	2.78	0.91	2.49	0.90
Bay D'Espoir 3	0.32	0.91	0.23	0.90
Bay D'Espoir 4	0.92	0.91	0.89	0.90
Bay D'Espoir 5	0.70	0.91	0.29	0.90
Bay D'Espoir 6	0.70	0.91	0.43	0.90
Bay D'Espoir 7	0.53	0.91	0.52	0.90
Hinds Lake	1.28	0.91	1.20	0.90
Upper Salmon	1.23	0.91	1.16	0.90
Cat Arm - 1	0.32	0.91	0.21	0.90
Cat Arm - 2	0.92	0.91	1.09	0.90
Granite Canal	1.23	0.91	3.41	0.90
Paradise River	1.89	0.91	1.78	0.90
Future Hydro	-	0.91	-	0.90
Gas Turbine	9.15	9.15	10.62	10.62
Holyrood	9.87	9.87	9.64	9.64
Diesel (Standby)	1.18	1.18	1.18	1.18
CCCT	--	5.00	--	5.00
Lab. Infeed (Gull to Sol. Pd.)	0.89	0.89	0.89	0.89
NP Hydro	3.07	3.07	3.19	3.19
DLP Hydro	3.07	3.07	3.19	3.19
AP Hydro	2.24	2.24	2.26	2.26

**IMPACT OF FORCED OUTAGE RATE CHANGES
ON SYSTEM LOLH**

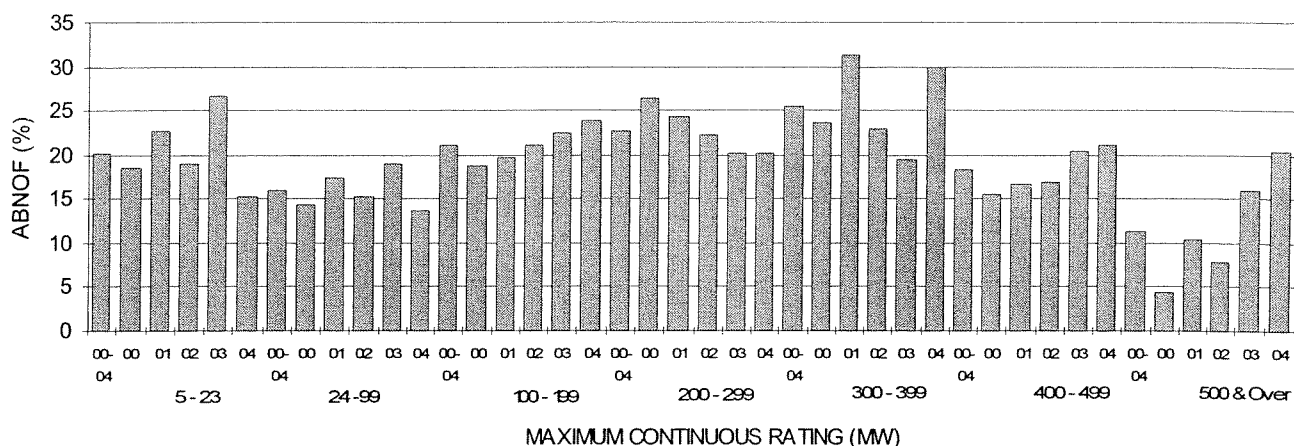
Existing System

	OLD	NEW	
YEAR	LOLH		LOLH
2004	0.89		0.88
2005	1.10		1.08
2006	1.49		1.47
2007	1.73		1.71
2008	2.02		1.99
2009	2.64		2.61
2010	3.30		3.26
2011	4.10		4.06
2012	10.02		9.94
2013	11.70		11.61
2014	13.96		13.86

** Basis for comparison drawn from "2004 Base Case - May 25.SAV"

Hydraulic Units
External Causes Excluded, 2000-2004 Data

Table 6.1.2
(Cont'd)

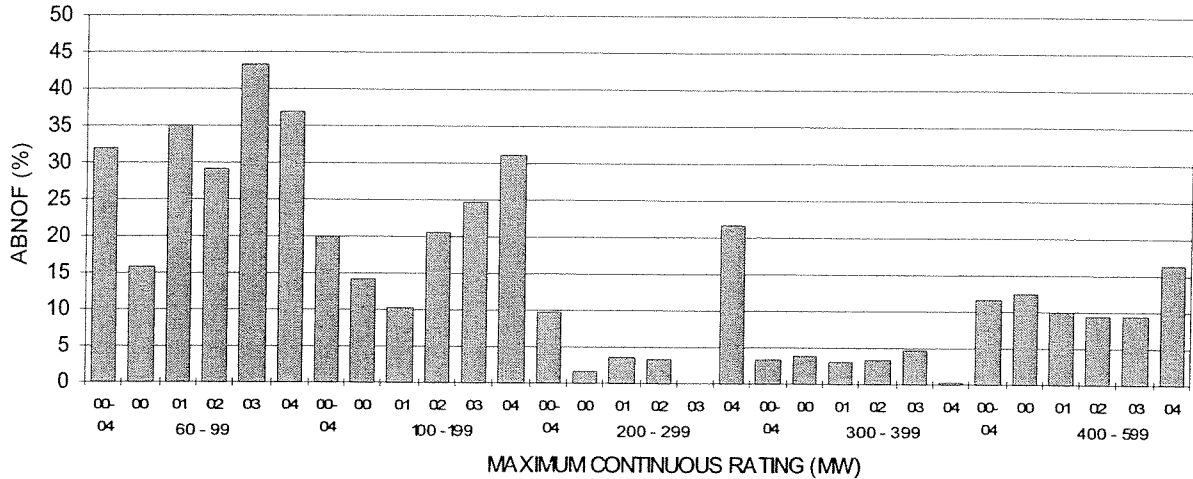


The effect of Maximum Continuous Rating on ABNOF by year for hydraulic generating units.

UNIT YEARS (A)	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP (%)	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE (%)	MOF (%)	POF (%)	
CLASSIFICATION BY MCR (MW)																
5 - 23	916.8	20.09	1.20	71.32	2,602	20.8	8,760.00	70.14	3.09	3.19	2.73	79.7	8.69	2.40	0.86	5.46
24 - 99	1,694.8	15.93	5.98	76.00	4,957	20.2	3,910.71	35.71	1.54	1.58	1.39	137.2	8.10	2.29	0.63	6.24
100 - 199	672.8	21.15	2.39	69.06	2,132	5.4	8,784.00	22.35	1.16	1.18	1.00	66.8	9.94	2.03	0.49	8.50
200 - 299	132.7	22.63	5.36	65.59	679	1.9	3,480.00	24.88	2.17	2.18	1.81	15.7	11.79	2.90	1.04	9.29
300 - 399	120.1	25.44	0.01	65.16	676	1.4	2,762.30	18.08	1.75	1.76	1.47	11.3	9.41	2.43	0.55	7.69
400 - 499	55.6	18.32	11.19	73.10	126	0.6	1,348.13	39.79	1.39	1.39	1.18	4.8	8.58	2.17	1.23	6.31
500 & OVER	42.0	11.46	0.00	79.27	103	0.3	464.68	22.09	0.77	0.77	0.73	3.9	9.27	3.00	1.04	7.61
CLASSIFICATION BY YEAR OF SERVICE																
0	6.9	15.07	1.31	70.15	59	0.2	358.35	23.03	3.09	3.12	2.79	1.0	14.84	6.98	2.66	9.88
1ST	6.0	24.05	1.43	67.31	31	0.2	688.23	49.80	4.16	4.16	3.38	0.5	8.65	5.66	0.31	5.41
2ND	4.0	32.35	0.00	63.37	16	0.0	178.31	27.17	1.92	1.92	1.54	0.2	4.29	4.73	1.62	1.43
3RD	6.9	22.70	0.00	61.24	23	0.8	4,584.00	314.85	16.30	16.30	13.03	1.1	16.06	1.65	0.17	3.97
4TH	13.7	19.77	0.00	70.00	57	0.5	192.75	82.83	5.33	5.33	4.43	1.4	10.23	3.24	0.33	5.96
5TH	17.9	29.30	0.02	66.89	48	0.1	124.03	13.58	0.62	0.62	0.53	0.7	3.81	1.17	0.23	3.16
6TH - 10TH	150.2	29.54	0.02	62.30	445	0.8	2,136.43	16.28	0.88	0.88	0.72	12.3	8.16	1.79	0.62	6.99
11TH - 15TH	96.1	31.99	3.23	60.99	474	0.9	1,195.10	16.04	1.46	1.46	1.18	6.8	7.03	2.58	0.85	5.27
16TH - 20TH	186.5	21.02	3.21	70.05	614	1.2	2,762.30	17.61	0.94	0.94	0.82	16.7	8.94	1.94	0.72	7.55
21ST - 25TH	245.5	20.05	2.86	71.70	740	3.0	8,784.00	35.28	1.66	1.67	1.40	20.3	8.26	1.83	0.63	6.41
26TH - 30TH	211.1	23.79	1.76	68.54	610	1.2	600.23	16.99	0.81	0.82	0.69	16.2	7.68	2.11	0.95	6.16
31ST - 35TH	307.1	24.24	6.67	63.71	1,205	3.8	3,480.00	27.92	1.92	1.96	1.59	37.2	12.10	2.92	0.77	10.04
36TH - 40TH	241.3	18.84	9.72	71.08	628	6.0	3,783.23	84.17	3.40	3.47	2.87	24.5	10.13	1.92	0.56	7.01
41ST - 45TH	479.0	14.47	2.89	77.46	1,474	5.4	3,910.71	32.38	1.45	1.46	1.30	39.3	8.20	2.30	0.54	6.39
46TH - 50TH	400.9	10.06	3.29	82.57	993	2.8	2,184.75	24.94	0.85	0.90	0.83	30.2	7.53	1.93	0.46	6.20
51ST - 55TH	250.3	15.95	4.69	76.06	799	1.6	1,179.55	17.94	0.85	0.87	0.79	20.1	8.02	2.46	0.83	6.50
56TH & OVER	1,011.3	17.35	3.85	73.71	3,059	21.9	8,760.00	62.82	2.86	2.96	2.63	91.1	9.01	2.58	0.77	6.00
CLASSIFICATION BY OPERATING FACTOR																
0 - 10	16.0	43.98	0.00	4.92	19	4.3	6,780.50	1,976.90	84.47	84.47	44.69	8.2	51.10	8.88	0.01	24.33
11 - 20	41.0	70.94	0.00	16.34	87	2.0	8,760.00	203.61	23.17	23.17	6.91	5.2	12.73	5.82	1.04	6.75
21 - 30	107.0	59.93	2.94	25.06	713	5.2	8,016.00	63.97	16.26	16.30	6.69	16.1	15.02	7.61	0.88	9.26
31 - 40	125.1	50.99	2.57	35.24	507	4.7	8,784.00	81.56	9.67	9.67	4.84	17.2	13.78	3.58	0.80	9.20
41 - 50	136.2	41.38	2.55	45.80	646	3.5	3,910.71	46.81	5.25	5.28	3.28	17.5	12.85	3.54	1.03	9.26
51 - 60	377.3	32.69	1.99	55.40	1,541	7.6	3,783.23	43.08	3.50	3.53	2.55	45.0	11.93	3.07	0.73	9.18
61 - 70	525.5	24.97	0.89	65.62	1,672	6.7	2,762.30	35.28	1.92	1.95	1.56	49.6	9.44	2.38	0.82	7.31
71 - 80	699.3	16.17	2.40	74.99	1,965	4.6	2,586.78	20.57	0.87	0.89	0.80	62.0	8.87	1.95	0.66	7.53
81 - 90	953.4	7.41	6.04	85.18	2,563	9.1	3,618.23	31.02	1.11	1.14	1.08	71.0	7.45	2.15	0.72	5.73
91 - 100	654.1	2.05	6.94	93.99	1,562	2.9	1,606.65	16.51	0.48	0.58	0.57	27.4	4.19	2.02	0.42	3.09
ALL UNITS	3,634.9	18.49	3.90	72.79	11,275	50.6	8,784.00	39.34	1.88	1.92	1.65	319.4	8.79	2.31	0.69	6.64

Fossil Units - All Fuel Types
External Causes Excluded, 2000-2004 Data

Table 6.2.2
(Cont'd)



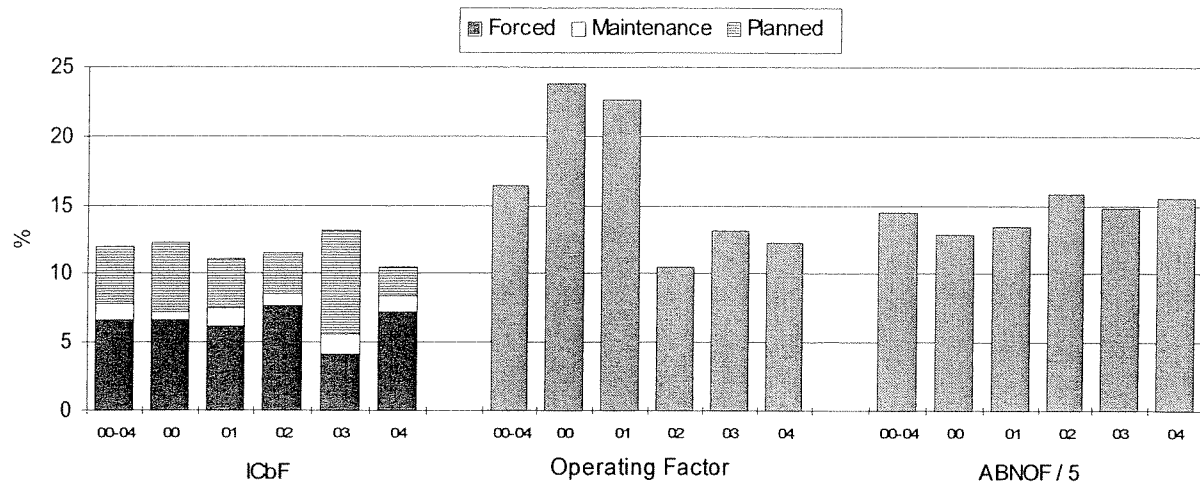
The effect of Maximum Continuous Rating on ABNOF by year for fossil generating units.

UNIT YEARS (A)	ABNOF (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	DAUFOP %	TOTAL EQ. OUT. TIME (A)	ICBF (%)	FAIL RATE	MOF (%)	POF (%)	
CLASSIFICATION BY MCR (MW)															
60 - 99	60.1	32.07	54.02	309	1.8	2,693.13	52.39	5.39	11.21	9.50	10.6	17.59	8.45	4.36	6.48
100 - 199	189.1	20.13	62.08	1,297	10.6	6,125.61	71.33	8.25	9.64	8.37	36.0	19.03	9.78	2.39	9.81
200 - 299	13.0	9.62	67.53	238	0.9	358.50	34.61	9.66	13.07	11.64	3.3	25.66	19.91	2.73	12.90
300 - 399	77.6	3.24	78.93	936	7.2	3,606.56	67.23	10.50	13.76	13.08	16.3	21.01	11.75	1.57	7.01
400 - 599	103.6	11.68	71.06	1,019	5.2	1,276.50	44.82	6.62	11.28	9.96	22.0	21.27	9.65	4.18	8.05
CLASSIFICATION BY YEAR OF SERVICE															
5TH	0.2	2.20	92.03	2	0.0	82.36	44.31	5.90	11.63	11.43	0.0	11.38	12.39	0.00	0.00
6TH - 10TH	18.8	0.80	90.87	125	0.3	232.58	24.22	1.98	2.68	2.67	1.7	9.11	6.60	0.76	5.74
11TH - 15TH	15.5	0.53	91.02	103	0.3	277.51	27.07	2.20	2.83	2.81	1.4	9.10	6.72	0.75	5.66
16TH - 20TH	43.3	1.91	86.03	384	1.4	589.90	30.85	3.50	4.39	4.36	5.6	13.00	9.45	0.78	8.16
21ST - 25TH	70.7	12.04	73.25	592	2.8	933.01	40.92	5.07	7.27	6.62	11.8	16.71	9.65	2.76	8.04
26TH - 30TH	98.4	15.01	70.84	884	3.6	1,276.50	35.38	4.87	9.01	7.86	17.2	17.51	10.25	3.36	7.17
31ST - 35TH	99.5	19.06	57.64	1,035	10.4	5,856.00	88.34	15.39	18.30	15.48	25.5	25.62	13.68	2.50	10.30
36TH - 40TH	56.1	36.62	39.88	380	4.6	6,125.61	106.51	17.11	21.87	15.69	14.8	26.40	10.81	4.19	11.08
41ST - 45TH	36.5	25.50	54.14	275	2.2	2,693.13	69.51	9.95	16.90	13.56	9.2	25.20	10.33	5.78	8.61
46TH & OVER	4.2	0.10	89.70	19	0.1	196.91	67.03	3.74	13.50	13.49	0.9	20.80	5.08	5.64	1.07
CLASSIFICATION BY OPERATING FACTOR															
0 - 10	5.0	25.57	1.36	8	2.8	5,856.00	3,097.55	97.65	97.67	74.42	3.7	73.13	29.41	0.33	16.23
11 - 20	10.0	40.52	14.65	28	2.3	6,125.61	715.52	60.94	61.04	39.88	4.7	46.81	12.28	2.84	19.15
21 - 30	45.0	53.81	25.49	245	1.2	933.01	43.46	9.57	12.05	6.54	9.8	21.70	11.32	4.97	13.04
31 - 40	45.0	45.86	34.82	129	1.7	5,266.45	114.13	9.68	13.19	8.94	9.5	21.04	6.18	5.37	10.22
41 - 50	30.0	29.23	45.26	539	4.2	2,192.48	68.21	23.59	31.20	22.66	9.2	30.58	21.56	3.78	7.74
51 - 60	25.0	27.84	54.86	144	0.7	1,435.16	42.98	4.89	9.11	7.26	5.0	19.81	9.54	7.03	7.45
61 - 70	20.0	13.05	65.00	147	1.6	3,606.56	93.59	10.77	12.69	11.14	4.7	23.69	10.30	1.80	12.30
71 - 80	80.1	5.23	75.19	775	4.2	1,276.50	47.77	6.56	11.25	10.56	19.1	23.87	8.92	4.33	9.96
81 - 90	93.0	0.35	87.01	1,077	4.9	2,693.13	39.89	5.71	9.09	9.14	14.9	16.01	12.44	0.95	6.42
91 - 100	90.1	0.09	92.48	707	2.1	260.98	26.40	2.49	3.48	3.51	7.7	8.57	8.14	0.53	4.53
ALL UNITS	443.4	16.51	66.20	3,799	25.7	6,125.61	59.37	8.07	11.20	9.75	88.2	19.90	10.31	2.94	8.55

Combustion Turbine Units

External Causes Excluded, 2000-2004 Data

Table 6.3.2



Yearly Comparison of ICbF, Operating Factor and ABNOF for combustion turbine generating units.

UNIT YEARS	ABNOF (%)	SYN.CD FACTOR (%)	OP FACTOR (%)	NO. OF FORCED OUTAGES	TOTAL F.O.T. (A)	MAXIMUM F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	UFOP (%)	DAUFOP (%)	SR	ICBF (%)	FAIL RATE (%)	MOF (%)	POF (%)
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CLASSIFICATION BY MCR (MW)

1 - 9	7.0	59.02	0.00	19.01	12	1.5	8,040.00	1,111.79	53.32	23.21	23.21	1.0000	21.97	3.00	0.23	0.01
10 - 24	30.0	87.80	5.64	7.13	55	1.4	3,896.20	219.68	39.18	8.65	8.65	0.9947	5.07	11.21	0.20	0.28
25 - 49	68.7	78.83	9.23	8.70	280	4.8	8,760.00	150.56	44.62	12.97	13.05	0.9854	13.41	24.78	1.58	3.88
50 & OVER	75.2	61.25	16.69	27.09	236	3.1	5,694.33	113.70	13.07	7.65	7.66	0.9579	12.57	4.27	1.05	6.54

CLASSIFICATION BY YEAR OF SERVICE

0	2.7	78.81	0.00	6.66	30	0.3	1,318.45	73.49	57.99	16.77	16.77	0.9701	14.53	32.91	4.15	1.17
1ST	2.0	91.52	0.00	5.63	2	0.0	3.60	1.80	0.36	0.34	0.71	0.9444	2.87	0.00	0.83	2.00
2ND	1.0	81.26	0.00	2.36	5	0.1	621.46	216.66	83.78	24.22	24.22	0.9643	16.39	83.52	0.02	4.19
5TH	2.0	91.69	0.04	0.87	3	0.0	88.06	32.32	38.70	4.97	4.97	0.9672	7.43	0.00	0.00	6.88
6TH - 10TH	24.5	85.76	8.94	8.47	57	0.1	138.90	21.36	6.27	3.27	3.27	0.9809	5.77	6.74	0.82	4.39
11TH - 15TH	5.5	82.50	15.79	8.73	22	0.0	139.06	15.23	7.43	4.55	4.55	0.9807	8.78	23.08	0.07	7.99
16TH - 20TH	7.6	41.15	50.78	37.03	57	1.3	4,759.75	200.01	31.55	21.75	21.94	0.9654	28.15	10.27	0.77	3.99
21ST - 25TH	48.3	62.98	16.01	23.95	151	2.4	5,694.33	138.98	17.15	8.80	8.81	0.9685	14.47	5.36	1.12	6.99
26TH - 30TH	44.1	65.85	9.32	22.04	172	3.1	8,760.00	158.68	24.28	10.93	11.01	0.9823	12.38	11.12	2.04	3.01
31ST - 35TH	24.8	83.54	5.59	9.91	43	0.6	1,137.21	130.05	20.65	6.69	6.69	0.9876	6.76	6.93	0.36	3.62
36TH - 40TH	8.4	93.45	5.14	0.31	21	0.5	3,896.20	204.20	94.92	16.47	16.47	0.9748	6.24	533.84	0.39	0.03
41ST - 45TH	5.0	78.79	0.00	6.05	12	0.8	744.00	553.90	71.49	18.06	18.06	0.9960	15.16	0.00	0.00	0.00
46TH & OVER	5.0	68.82	0.00	0.93	8	1.5	8,040.00	1,658.26	97.02	34.48	34.48	1.0000	30.26	0.00	0.00	0.00

CLASSIFICATION BY OPERATING FACTOR

0 - 10	108.3	89.18	6.23	1.81	286	5.7	8,760.00	173.98	74.38	10.77	10.77	0.9786	9.64	49.06	1.09	2.68
11 - 20	25.6	73.95	10.77	13.38	161	2.4	4,759.75	130.89	41.25	16.13	16.38	0.9899	15.22	23.64	1.21	2.07
21 - 30	1.0	74.94	0.00	23.82	3	0.0	67.06	25.05	3.47	2.22	2.22	1.0000	1.24	12.56	0.38	0.00
31 - 40	10.0	52.67	13.06	37.62	38	0.4	2,339.25	95.11	9.87	6.44	6.44	0.9688	9.71	3.72	0.53	5.06
41 - 50	5.0	32.13	28.73	45.73	27	0.4	2,345.80	140.78	15.94	13.76	13.76	0.8305	22.14	6.99	4.20	9.27
51 - 60	25.0	26.57	25.65	54.71	60	1.8	5,694.33	266.90	11.78	9.65	9.65	0.9670	18.71	3.51	0.73	10.68
71 - 80	5.0	16.57	38.39	71.37	7	0.0	22.08	11.20	0.25	0.25	0.25	0.9302	12.06	1.12	0.05	11.84
81 - 90	1.0	10.41	0.00	88.27	1	0.0	0.35	0.35	0.00	0.00	0.00	1.0000	1.32	1.13	1.24	0.07
ALL UNITS	181.0	72.24	11.38	16.48	583	10.8	8,760.00	161.94	26.54	10.62	10.65	0.9782	12.01	8.82	1.08	4.24

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CANADIAN ELECTRICITY ASSOCIATION
EQUIPMENT RELIABILITY INFORMATION SYSTEM

DATE: 06-01-05

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GENERATING UNIT PERFORMANCE REPORT

GA - RP40

FOR UTILITY: Newfoundland And Labrador Hydro
FOR PERIOD: 2000-01-01:00:00 TO 2005-01-01:00:00
EXTERNAL CAUSES: Excluded

Hydraulic Generating Unit

UNIT HOURS (H)	ABNOF (%)	SYN.CD FACTOR (%)	OP TIME (H)	OP FACTOR (%)	NO. FORCED OUTAGES	TOT F.O.T. (H)	MAX F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	TOT EQ. OUT.TIME (H)	ICBF (%)	FAIL RATE	ATTEMPTED STARTS	SUCCESSFUL STARTS	MOF (%)	POF (%)
Bay D'Espoir																	
Bay D'Espoir - 01																	
43,843.32	15.65	0.00	32,603.14	74.36	8	81.82	22.06	10.23	0.25	0.25	4,381.00	9.99	1.34	678	678	0.79	9.01
Bay D'Espoir - 02																	
43,838.93	59.43	0.00	12,057.10	27.50	15	307.76	128.23	20.52	2.49	2.49	5,730.34	13.07	6.54	1278	1277	0.90	11.47
Bay D'Espoir - 03																	
43,846.48	2.44	0.00	38,459.51	87.71	13	88.59	24.08	6.81	0.23	0.23	4,317.37	9.85	0.68	148	146	2.21	7.44
Bay D'Espoir - 04																	
43,838.55	60.47	0.00	13,917.81	31.75	15	124.54	28.55	8.30	0.89	0.89	3,410.03	7.78	2.52	1328	1326	1.60	5.90
Bay D'Espoir - 05																	
43,838.55	47.31	0.00	20,396.62	46.53	7	58.80	21.86	8.40	0.29	0.29	2,701.05	6.16	1.29	1353	1352	2.03	4.00
Bay D'Espoir - 06																	
43,839.30	48.39	0.00	20,137.55	45.93	10	87.36	25.81	8.74	0.43	0.43	2,491.38	5.68	2.18	1258	1257	0.87	4.61
Bay D'Espoir - 07																	
43,846.31	0.03	4.18	41,150.48	93.85	6	216.76	194.16	36.13	0.52	0.52	2,680.98	6.11	0.64	28	28	0.25	5.37
Hind's Lake																	
Hind's Lake - 01																	
43,838.97	33.80	0.00	26,848.35	61.24	21	321.03	80.68	15.29	1.18	1.20	2,188.87	4.99	3.92	1300	1296	0.93	3.30
Upper Salmon																	
Upper Salmon - 01																	
43,844.15	8.75	0.00	37,420.81	85.35	38	436.59	95.66	11.49	1.15	1.16	2,587.39	5.90	5.85	544	538	1.67	3.24

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CANADIAN ELECTRICITY ASSOCIATION
EQUIPMENT RELIABILITY INFORMATION SYSTEM

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GENERATING UNIT PERFORMANCE REPORT

GA - RP40

FOR UTILITY: Newfoundland And Labrador Hydro
FOR PERIOD: 2000-01-01:00:00 TO 2005-01-01:00:00
EXTERNAL CAUSES: Excluded

Hydraulic Generating Unit

UNIT HOURS (H)	ABNOF (%)	SYN.CD FACTOR (%)	OP TIME (H)	OP FACTOR (%)	NO. FORCED OUTAGES	TOT F.O.T. (H)	MAX F.O.D. (H)	MEAN F.O.D. (H)	FOR (%)	DAFOR (%)	TOT EQ. OUT.TIME (H)	ICBF (%)	FAIL RATE	ATTEMPTED STARTS	SUCCESSFUL STARTS	MOF (%)	POF (%)
Cat Arm																	
Cat Arm - 01																	
43,845.84	3.46	2.87	39,828.86	90.84	18	82.44	14.61	4.58	0.21	0.21	2,501.57	5.71	3.08	191	190	1.29	4.23
Cat Arm - 02																	
43,846.20	1.99	3.09	40,976.85	93.46	30	395.46	82.90	13.18	0.96	1.09	2,051.49	4.68	4.49	135	134	0.53	3.12
Paradise River																	
Paradise River - 01																	
43,842.72	45.38	0.00	21,499.75	49.04	25	389.08	64.45	15.56	1.78	1.78	2,445.97	5.58	6.93	756	751	0.88	3.82
Granite Canal																	
Granite Canal - 01																	
12,481.35	9.51	0.00	10,175.14	81.52	29	346.45	218.58	11.95	3.29	3.41	1,159.13	9.29	14.64	188	178	2.69	3.50

Hydraulic Generating Unit: 13