

1 **Q. DISTRIBUTION**

2
3 **PUB 30.0 (RE: Volume II, Distribution Appendix 1, Attachment A)**

4
5 **PUB 30.1**

6 **Provide a copy of the “2004 Corporate Distribution Reliability Review”.**

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8 A. A copy of the *2004 Corporate Distribution Reliability Review* is provided in Attachment A.

Newfoundland Power
2004 Corporate Distribution Reliability Review

March 2004

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1.0 INTRODUCTION

Customers have advised the Company through satisfaction polls that service reliability is one of the most important issues in providing electrical power to them. Through the years Newfoundland Power has held reliability of service as a cornerstone of its commitment to its customers.

One of the primary means used by the Company to measure reliability is through the use of outage statistics. Outage statistics are used to identify and prioritize projects and initiatives.

Through the use of outage information the Company has identified and delivered many initiatives focused on improving service reliability. Recent highlights include the replacement of defective insulators on transmission lines, substations and distribution feeders, and the upgrading of distribution lines to the Bay de Verde area, the Burin Peninsula, Robinsons, and the Cape Shore.

To ensure that customers receive maximum value from the power system, the Company has undertaken a comprehensive review of the reliability of its distribution system in order to identify distribution upgrade projects for the upcoming 2005 five-year capital forecast.

This report documents the findings of the Company's review.

2.0 BACKGROUND

Newfoundland Power maintains and improves the reliability of its distribution system using a wide range of tactics. The five main areas of focus are noted below:

1. Investigate feeder reliability statistics to assist in identifying feeders that are exhibiting poor reliability. The worst feeders are then targeted for detailed engineering review and subsequent upgrading. This process is the driver for large feeder upgrading projects that are included in the capital budget program.
2. Through reports from operations and reliability statistics, defective components are identified, investigated, and major replacement programs are initiated. Recent initiatives include insulator, automatic sleeves, and porcelain cutout replacement programs.
3. Routine inspection of distribution lines gives rise to general maintenance on distribution lines and, depending on the number of deficiencies found, targeted detailed inspections and subsequent major upgrading may occur. An example of this is a recent concern over the general age of distribution poles. Through targeted inspections and pole testing in St. John's, a general replacement program has begun.

4. Regional staff, as part of their regular activities, identify locations where the general deterioration of the system needs to be addressed. This gives rise to a large number of small upgrading projects.

5. Technology and changes in work processes are used to minimize the impact a fault on a distribution line has on customers. Recent examples include the on- going upgrading of the SCADA system to increase the number of substations tied to SCADA as well as individual feeder control, enhanced outage management by associating individual customers to feeders within the customer service system and managing trouble call response to meet response time targets.

This report focuses on the identification of upgrading requirements through outage statistics.

3.0 GOAL

The goal of the review is to develop an inventory of projects that the Company should pursue over the next five years to ensure the continuous improvement of reliability of the distribution system.

4.0 METHODOLOGY

To complete the identification of projects, the following process was followed.

- Rank the worst 25 feeders according to the customer interruption statistics for unplanned distribution related outages¹. The statistics used were the average annual total number of customer minutes of interruption², System Average Interruption Frequency Index (SAIFI) and the System Average Interruption Duration Statistic (SAIDI). The statistics were based on an average of the period from January 1999 to December 31 2003 (Five years).
- Review the worst feeders in detail for the following:
 - Is the feeder a constantly poor performer or is the feeder's performance associated with an unusually poor year. When necessary the statistics prior to 1999 were investigated.
 - Has the feeder experienced any upgrading during the past five years and has it solved the apparent reliability problem.
 - Have regional personnel reviewed the list and identified potential upgrading requirements for the feeders that should improve the reliability of distribution feeder.
- Compile a list of projects for the five-year forecast.

¹ - The 25 feeders exclude those feeders that were subject to major upgrades within the past five years.

² - The number of customer minutes for an outage is the duration of the outage times the number of customers affected. A 5-minute power interruption affecting 100 customers would have a customer minute total of 500. This statistic recognizes the duration of the power interruptions experienced and the number of customers affected.

5.0 RESULTS

Appendix A lists the 25 worst feeders according to customer minute interruption statistics, SAIFI and SAIDI.

Appendix B provides commentary on the condition of each feeder listed in Appendix A, any recent upgrading on the feeder, and proposed upgrading projects for the feeder.

A significant portion of the feeders reviewed experienced one poor year in the past five years, indicating no consistent problems. Upgrading on these feeders in general would not necessarily result in significant improvement on their historic performance. There are also a number of feeders that have recently experienced some small upgrading and as a result may not require further upgrading. The performance of these feeders over the next couple of years will determine if a further review of their condition is required. The Feeder Improvement Program (FIP) will also aid in identifying small and large initiatives that will positively impact reliability.

Appendix C sets out the projects that should be included in the five year forecast and a list of those feeders that should be reviewed prior to development of the 2006 five year forecast.

This study focused on identifying projects that would address the reliability concerns on the feeders exhibiting the poorest reliability. The use of outage statistics did not allow identification of pockets of poor reliability within a given feeder. While conducting this study, projects were proposed that impact small pockets of customers. The poor reliability of these feeders is often hardly noticeable when the overall statistics for the feeder are examined. While these projects should still be put forward for inclusion in the capital program as reliability rebuilds, their priority could not be set through the methodology followed in this report. As a result these projects are not identified in Appendix C.

6.0 CONCLUSIONS AND RECOMMENDATIONS

There are a number of projects that should be pursued in the coming years to address the feeders exhibiting poor reliability performance. There are other feeders that should be reviewed prior to the development of the 2006 budget to identify potential projects to improve their performance.

The Company should continue to monitor the performance of its feeders through the customer interruption statistics. This monitoring should confirm that over time the upgrading has improved reliability and identify feeders that exhibit poor reliability, which in turn require further review.

The Company should pursue upgrading projects that impact small pockets of poor reliability. However, their priority cannot be determined through the current customer interruption statistics.

Appendix A

Results of Ranking Feeders by Customer Minutes of Outage, SAIFI and SAIDI

**Five Year Average Unscheduled Distribution Related Outages
1999-2003
Sorted By Customer Minutes of Interruption**

Feeder	Annual Customer Interruptions	Annual Customer Minutes of Interruption		Annual SAIFI		Annual SAIDI	
	Cust Int. per Year	Cust Min per Year	Rank	Int. per Year per Cust	Rank	Hours per Year per Cust	Rank
BCV2	6,444	748,560	1	4.11	8	7.86	8
PUL1	5,169	672,376	2	2.62	32	5.71	22
BOT1	5,873	659,256	3	3.73	15	6.97	14
LEW2	5,984	572,410	4	3.98	10	6.33	17
PEP1	5,096	566,473	5	3.77	14	6.90	15
KEL2	3,400	531,641	6	2.36	45	6.12	18
CHA2	3,426	498,954	7	2.12	52	5.08	28
PUL2	4,288	486,796	8	2.97	26	5.61	24
BRB2	839	473,618	9	1.17	153	8.27	5
SMV1	3,772	441,589	10	3.66	16	7.22	11
HWD7	6,679	434,800	11	3.95	11	4.32	36
GBY2	3,045	434,062	12	3.45	19	8.18	6
CHA1	2,736	412,648	13	0.92	184	2.37	97
SUM1	2,311	403,661	14	1.54	108	4.59	30
SCV1	3,652	401,902	15	2.53	39	4.77	29
WES2	3,001	366,753	16	3.94	12	8.04	7
BRB4	2,075	361,595	17	2.07	56	6.08	19
RRD9	2,220	355,404	18	2.02	62	5.56	26
LET1	3,911	345,731	19	2.17	49	3.19	66
DLK3	4,231	343,512	20	4.12	7	5.70	23
GDL6	3,057	340,982	21	2.11	53	3.80	44
HOL2	677	335,482	22	1.52	109	11.46	2
SPF2	2,671	329,307	23	1.77	87	3.66	49
CAB1	4,111	323,192	24	4.10	9	5.38	27
KEN4	5,475	320,053	25	2.57	35	2.52	93
Company Average		1,095	95,865	1.56		2.30	

**Five Year Average Unscheduled Distribution Related Outages
1999-2003
Sorted By SAIFI**

Feeder	Annual Customer Interruptions	Annual Customer Minutes of Interruption		Annual SAIFI		Annual SAIDI	
	Cust Int. per Year	Cust Min per Year	Rank	Int. per Year per Cust	Rank	Hours per Year per Cust	Rank
BHD1	5,965	189,575	47	5.74	1	3.34	62
STX1	5,303	143,409	65	5.72	2	2.53	91
STG2	2,315	106,108	88	5.12	3	3.92	40
HUM9	2,172	115,864	80	4.95	4	4.43	35
STG1	1,416	64,836	131	4.70	5	3.54	54
ABC1	2,970	99,256	96	4.15	6	2.25	104
DLK3	4,231	343,512	20	4.12	7	5.70	23
BCV2	6,444	748,560	1	4.11	8	7.86	8
CAB1	4,111	323,192	24	4.10	9	5.38	27
LEW2	5,984	572,410	4	3.98	10	6.33	17
HWD7	6,679	434,800	11	3.95	11	4.32	36
WES2	3,001	366,753	16	3.94	12	8.04	7
DLK1	3,407	80,882	114	3.81	13	1.52	151
PEP1	5,096	566,473	5	3.77	14	6.90	15
BOT1	5,873	659,256	3	3.73	15	6.97	14
SMV1	3,772	441,589	10	3.66	16	7.22	11
GBS2	1,584	75,084	121	3.56	17	2.92	78
FER1	2,204	270,286	30	3.49	18	7.06	13
GBY2	3,045	434,062	12	3.45	19	8.18	6
BVA2	2,669	216,418	39	3.26	20	4.44	31
LGL1	1,460	64,212	133	3.19	21	2.20	108
SUM2	2,322	261,382	31	3.19	22	6.04	20
LOK1	3,248	232,215	35	3.12	23	3.72	47
GBS1	1,957	89,002	107	3.02	24	2.31	100
TRP1	2,059	91,054	103	2.98	25	2.23	105
Company Average	1,095	95,865		1.56		2.30	

**Five Year Average Unscheduled Distribution Related Outages
1999-2003
Sorted By SAIDI**

Feeder	Annual Customer Interruptions	Annual Customer Minutes of Interruption		Annual SAIFI		Annual SAIDI	
	Cust Int. per Year	Cust Min per Year	Rank	Int. per Year per Cust	Rank	Hours per Year per Cust	Rank
TRP2	15	8,710	237	2.85	29	37.35	1
HOL2	677	335,482	22	1.52	109	11.46	2
SPR3	4	1,640	269	1.60	102	10.96	3
GPD1	456	114,694	82	1.99	64	8.34	4
BRB2	839	473,618	9	1.17	153	8.27	5
GBY2	3,045	434,062	12	3.45	19	8.18	6
WES2	3,001	366,753	16	3.94	12	8.04	7
BCV2	6,444	748,560	1	4.11	8	7.86	8
WES1	1,005	184,649	49	2.54	38	7.76	9
WES3	1,005	240,089	33	1.94	68	7.71	10
SMV1	3,772	441,589	10	3.66	16	7.22	11
QTZ1	0.4	1,298	271	0.13	282	7.21	12
FER1	2,204	270,286	30	3.49	18	7.06	13
BOT1	5,873	659,256	3	3.73	15	6.97	14
PEP1	5,096	566,473	5	3.77	14	6.90	15
BUC2	406	60,496	138	2.55	37	6.33	16
LEW2	5,984	572,410	4	3.98	10	6.33	17
KEL2	3,400	531,641	6	2.36	45	6.12	18
BRB4	2,075	361,595	17	2.07	56	6.08	19
SUM2	2,322	261,382	31	3.19	22	6.04	20
GBY3	1,277	280,780	28	1.64	97	5.98	21
PUL1	5,169	672,376	2	2.62	32	5.71	22
DLK3	4,231	343,512	20	4.12	7	5.70	23
PUL2	4,288	486,796	8	2.97	26	5.61	24
VIR1	2,157	305,215	26	2.37	44	5.56	25
Company Average		1,095	95,865	1.56		2.30	

Appendix B

Detailed Review of Feeders

Detailed Review of Distribution Feeders

The following is a detailed listing of the feeders that exhibited the poorest reliability from 1999 to 2003. The list contains all the feeders shown in Appendix A, sorted alphabetically.

ABC-01

Location: Supplies the Port au Port Peninsula from Abraham's Cove to Cape St. George.

Feeder Statistics:

Number of Customers:	763			
Approximate Feeder Length	47.32	km (2000-2001 Survey)		
Average Annual Customer Minutes:	99,255	minutes	Ranking	96
Average Annual SAIFI:	4.15	interruptions	Ranking	6
Average Annual SAIDI:	2.25	hours	Ranking	104

Comments:

In 1999 there were 12 short interruptions due to salt contamination during a windstorm. This represents about 58% of the SAIFI statistic for the feeder. During 2000 and 2001 the defective insulators on the feeder were replaced. No need for a major upgrade of this feeder has been identified to address historic reliability performance. During 2003, the unscheduled distribution outage statistics were 64,578 customer minutes, a SAIFI of 1.11 and a SAIDI of 1.41 hours

BCV-02

Location: Supplies Bell Island, Conception Bay, through a Submarine Cable.

Feeder Statistics:

Number of Customers:	1532			
Approximate Feeder Length	62.02	km (2000-2001 Survey)		
Average Annual Customer Minutes:	748,560	minutes	Ranking	1
Average Annual SAIFI:	4.11	interruptions	Ranking	8
Average Annual SAIDI:	7.86	hours	Ranking	8

Comments:

Statistics need to be combined with FRT-01 and FRT-02 in order to compare with other feeders. Combined average annual customer minutes – 927,700, SAIFI – 4.6, SAIDI – 9.65 hours.

During 2000 all the defective insulators along the feeder's trunk were replaced. Slope stabilization of the hill behind the cable termination on Bell Island is scheduled for 2004 at an estimated cost of \$70,000. This feeder was inspected under the Feeder Improvement Program (FIP) in 2004 which identified work to be completed in 2005 addressing some older poles and conductor. One outage in 2003 (broken pole) accounted for 588,000 (68%) of the minutes and

6.13 (65%) of SAIFI in 2003. During 2003, the unscheduled distribution outage statistics were 866,630 customer minutes, a SAIFI of 3.67 and a SAIDI of 9.43 hours.

BHD-01

Location: Supplies customers west of Stephenville from Romaines to Campbell's Creek to Boswarlos and Fox Island River.

Feeder Statistics:

Number of Customers:	859			
Approximate Feeder Length	58.45	km (2000-2001 Survey)		
Average Annual Customer Minutes:	189,575	minutes	Ranking	47
Average Annual SAIFI:	5.74	interruptions	Ranking	1
Average Annual SAIDI:	3.34	hours	Ranking	62

Comments:

In 1999 there were 13 short interruptions due to salt contamination during a windstorm. This represents about 42% of the SAIFI statistic for the feeder. The feeder was included in the FIP for 2004 and the resulting work will be completed in 2005. A significant upgrade is required to address extremely high winds in the Pinetree area. An engineering assessment will be done in 2005 and resulting work will be done in 2006 at preliminary estimate of \$400,000.

During 2003, the unscheduled distribution outage statistics were 386,463 customer minutes, a SAIFI of 6.73 and a SAIDI of 7.49 hours.

BOT-01

Location: West side of the Bay of Exploits supplying communities between Botwood, Leading Tickles and Cottrell's Cove. This feeder is over 150 km long.

Feeder Statistics:

Number of Customers:	1596			
Approximate Feeder Length	199.15	km (2000-2001 Survey)		
Average Annual Customer Minutes:	659,256	minutes	Ranking	3
Average Annual SAIFI:	3.73	interruptions	Ranking	15
Average Annual SAIDI:	6.97	hours	Ranking	14

Comments:

As a result of a detailed inspection, upgrading in 1999 focused on insulator replacement and brush clearing. In 2001 there was a focus on tree trimming. During 2002, a recloser was replaced to improve coordination between it and down-line reclosers to reduce the customers exposed to power interruptions. Some upgrading due to clearance concerns has been completed as well and all these measures have improved reliability measurably. This feeder is considered

to be in good condition and a further review is planned for 2005. A section of line that is fairly old, that could be transferred in to a new line recently constructed for Aliant, will be evaluated for 2006. During 2003, the unscheduled distribution outage statistics was 373,079 customer minutes, a SAIFI of 1.74 and a SAIDI of 3.87 hours.

BRB-02

Location: Supplies a portion of Bay Roberts along the east side of the Conception Bay Highway from the Bay Roberts substation to Shearstown Road, Spaniard's Bay. It is back to back with ILC-02 near the Anglican Church, Rectory Avenue.

Feeder Statistics:

Number of Customers:	452			
Approximate Feeder Length	14.12	km (2003 Survey)		
Average Annual Customer Minutes:	473,618	minutes	Ranking	9
Average Annual SAIFI:	1.17	interruptions	Ranking	153
Average Annual SAIDI:	8.27	hours	Ranking	5

Comments:

The performance statistics of this feeder are skewed by the April 1999 snowstorm that accounted for 2,239,265 or 95% of the customer minutes in the average. A small section was upgraded in 2001. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 1378 customer minutes, a SAIFI of .04 and a SAIDI of .05 hours.

BRB-04

Location: Supplies the Southern part of Bay Roberts, around Country Road, and along Bare Need Road through Port de Grave to Hibb's Cove.

Feeder Statistics:

Number of Customers:	1018			
Approximate Feeder Length	30.90	km (2003 Survey)		
Average Annual Customer Minutes:	361,595	minutes	Ranking	17
Average Annual SAIFI:	2.07	interruptions	Ranking	56
Average Annual SAIDI:	6.08	hours	Ranking	19

Comments:

An April 1999 storm resulted in 1,166,220 customer minutes of outage, representing 65% of the average for the past five years. Outages during 2002 brought attention to two sections of the feeder that have experienced problems in the past and need to be upgraded. Upgrading these sections of the feeder is required. This was budgeted for 2004 at an estimated cost of \$120,000 but has been deferred to 2005.

During 2003, the unscheduled distribution outage statistics were 174,970 customer minutes, a SAIFI of 2.76 and a SAIDI of 2.86 hours.

BUC-02

Location: Leaves Buchans Substation and goes north to Buchans Junction and then to Millertown.

Feeder Statistics:

Number of Customers:	159			
Approximate Feeder Length	40.38	km (2000-2001 Survey)		
Average Annual Customer Minutes:	60,496	minutes	Ranking	138
Average Annual SAIFI:	2.55	interruptions	Ranking	37
Average Annual SAIDI:	6.33	hours	Ranking	16

Comments:

Several years ago brush clearing was performed along this line and another review will be conducted to identify and remove larger trees in 2005. Long sections of trunk feeder have 8080 and 2-piece insulators which will need to be changed at an estimated cost of \$100,000 in 2006. These 2 initiatives are expected to positively impact the reliability of this feeder.

During 2003, the unscheduled distribution outage statistics were 75,692 customer minutes, a SAIFI of 4.09 and a SAIDI of 7.93 hours.

BVA-02

Location: Services part of the Town of Bonavista (Confederation Dr, Sebastian Dr., Red Point Road, and the Cape Shore Road.

Feeder Statistics:

Number of Customers:	906			
Approximate Feeder Length	17.76	km (2000-2001 Survey)		
Average Annual Customer Minutes:	216,417	minutes	Ranking	39
Average Annual SAIFI:	3.26	interruptions	Ranking	20
Average Annual SAIDI:	4.44	hours	Ranking	31

Comments:

This feeder has a FPI fish plant on it and experiences problems with its insulators as the feeder is very close to the water. This feeder will have work performed under the 2004 FIP program that will positively impact reliability. One outage due to a broken pole (vehicle accident) caused 137,555 minutes (62%), .5 SAIFI (18%), and 2.53 SAIDI (62%) during 2003. No need for a significant feeder upgrade has been identified.

During 2003, the unscheduled distribution outage statistics were 221,101 customer minutes, a SAIFI of 2.76 and a SAIDI of 4.06 hours.

CAB-01

Location: Supplies the Southern Shore of the Avalon Peninsula from La Manche to Quarry Road, Ferryland

Feeder Statistics:

Number of Customers:	1090			
Approximate Feeder Length	62.82	km (2000-2001 Survey)		
Average Annual Customer Minutes:	323192	minutes	Ranking	24
Average Annual SAIFI:	4.10	interruptions	Ranking	9
Average Annual SAIDI:	5.38	hours	Ranking	27

Comments:

During 2000 all the defective insulators were replaced along the trunk feeder. A number of small projects have been identified to address concerns over deteriorated conductor and the ability to transfer load between CAB-01 and FER-01. This work, to be completed in 2004, will improve the reliability of this feeder. In addition, this feeder was inspected under the FIP program in 2004 and work will be completed in 2005. One sleet storm in 2003 contributed 310,464 minutes (69%), to the totals for 2003. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 447,654 customer minutes, a SAIFI of 4.27 and a SAIDI of 6.84 hours.

CHA-01

Location: Supplies a section of Conception Bay South in the Topsail / Manuels / Long Pond Area from Fowler's Road and Neil's Pond to Dunn's Hill Road.

Feeder Statistics:

Number of Customers:	3247			
Approximate Feeder Length	55.57	km (2000-2001 Survey)		
Average Annual Customer Minutes:	412,647	minutes	Ranking	13
Average Annual SAIFI:	.92	interruptions	Ranking	184
Average Annual SAIDI:	2.37	hours	Ranking	97

Comments:

Customer Minutes are ranked high due to large number of customers that are exposed to a fault on the feeder trunk. This is a candidate for off loading or sectionalizing. One outage during the April 1999 storm accounts for 1,132,954 customer minutes, or 55% of the total above. This feeder was inspected under the FIP program inspection in 2004 and any identified improvements will be addressed in 2005. As well, a study entitled "Conception Bay South Planning Study" suggested a new feeder out of CHA substation should be constructed to reduce the number of customers on CHA-01 and to address load growth in the CBS Area. This new feeder is being constructed in 2004 at an estimated cost of \$339,000, and will improve the reliability of this feeder. During 2003, the unscheduled distribution outage statistics were 333,437 customer minutes, a SAIFI of 1.35 and a SAIDI of 1.71 hours.

CHA-02

Location: Supplies a section of Conception Bay South in the Manuels / Topsail Areas from Neil's Line to Frog Marsh Road.

Feeder Statistics:

Number of Customers:	1073	(1350 prior to transfer in 2001)		
Approximate Feeder Length	46.89	km (2000-2001 Survey)		
Average Annual Customer Minutes:	498,954	minutes	Ranking	7
Average Annual SAIFI:	2.12	interruptions	Ranking	52
Average Annual SAIDI:	5.08	hours	Ranking	28

Comments:

The average performance statistics of this feeder are poor due to the April 1999 snowstorm during which a single outage accounted for 1,078,106 or 43% of the customer minutes above. No need for a major upgrade of this feeder has been identified to address historic reliability performance, and this feeder was inspected under the FIP program in 2004 and the resulting work will be completed in 2005. However, a new feeder out of CHA substation is being constructed in 2004 at an estimated cost of \$339,000 to alleviate loading issues in the area.

During 2003, the unscheduled distribution outage statistics were 182,994 customer minutes, a SAIFI of 1.25 and a SAIDI of 2.84 hours.

DLK-01

Location: A portion of the community of Deer Lake

Feeder Statistics:

Number of Customers:	826			
Approximate Feeder Length	12.74	km (2000-2001 Survey)		
Average Annual Customer Minutes:	80.882	minutes	Ranking	114
Average Annual SAIFI:	3.81	interruptions	Ranking	13
Average Annual SAIDI:	1.52	hours	Ranking	151

Comments:

During 2000, a Slow Gas Alarm on portable 135 caused 10 trips, 24% of the five-year average. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 149,978 customer minutes, a SAIFI of 2.94 and a SAIDI of 3.02 hours.

DLK-03

Location: This feeder feeds a commercial area of the Town of Deer Lake, Deer Lake Airport, the communities of Reidville, Cormack and the Bonne Bay Big Pond Cabin area.

Feeder Statistics:

Number of Customers:	1032			
Approximate Feeder Length	126.72	km (2000-2001 Survey)		
Average Annual Customer Minutes:	343,511	minutes	Ranking	20
Average Annual SAIFI:	4.12	interruptions	Ranking	7
Average Annual SAIDI:	5.70	hours	Ranking	23

Comments:

A storm in April 1999 resulted in 612,555 Customer Minutes of outage due to trees in the line. Major work in the last few years has focused on Tree Trimming / Brush Clearing in the Cormack / Bonne Bay Big Pond (BBBP) areas which has improved the reliability of the feeder. Additional tree trimming/removal is planned for 2004, and the feeder has been inspected in 2004 and work planned for FIP program work in 2005. A reliability project for 2006 (\$300,000) will relocate lines to deal with accessibility issues and large trees that cannot be trimmed as they provide wind protection for farms.

During 2003, the unscheduled distribution outage statistics were 90,258 customer minutes, a SAIFI of .45 and a SAIDI of 1.46 hours.

FER-01

Location: Supplies Southern Shore of the Avalon from Cappahaden to Quarry Road Ferryland.

Feeder Statistics:

Number of Customers:	627			
Approximate Feeder Length	48.45	km (2000-2001 Survey)		
Average Annual Customer Minutes:	270,285	minutes	Ranking	30
Average Annual SAIFI:	3.49	interruptions	Ranking	18
Average Annual SAIDI:	7.06	hours	Ranking	13

Comments:

The storm on December 1st and 2nd of 2000 resulted in 602,514 customer minutes of outages, representing 45% of the total customer minutes over the period. A number of conductor related projects have been identified to improve the ability to transfer load between CAB-01 and FER-01 and are planned for 2004. In addition, this feeder has been inspected in 2004 and is scheduled for FIP work in 2005.

During 2003, the unscheduled distribution outage statistics were 302,130 customer minutes, a SAIFI of 6.03 and a SAIDI of 8.03 hours.

GBS-01

Location: Feeds the industrial Park and residential sub-divisions within Port Aux Basques.

Feeder Statistics:

Number of Customers:	680			
Approximate Feeder Length	14.66	km (2000-2001 Survey)		
Average Annual Customer Minutes:	89,002	minutes	Ranking	107
Average Annual SAIFI:	3.02	interruptions	Ranking	24
Average Annual SAIDI:	2.31	hours	Ranking	100

Comments:

This line is in excellent condition though it is exposed to very harsh conditions in the Port Aux Basques area. The tap to the residential sub-divisions was upgraded in 2003.

During 2003, the unscheduled distribution outage statistics were 120,788 customer minutes, a SAIFI of 3.11 and a SAIDI of 2.96 hours.

GBS-02

Location: Supplied an area from the substation at Grand Bay, northeast to Red Rocks, and an area from the Grand Bay substation southeast to Margaree, including a portion of the Town of Channel - Port Aux Basques.

Feeder Statistics:

Number of Customers:	444			
Approximate Feeder Length	49.45	km (2000-2001 Survey)		
Average Annual Customer Minutes:	75,084	minutes	Ranking	121
Average Annual SAIFI:	3.56	interruptions	Ranking	17
Average Annual SAIDI:	2.92	hours	Ranking	78

Comments:

During 2003, approximately \$75,000 was spent on replacing defective insulators and upgrading structures along a section of the feeder. This addressed certain high priority reliability and clearance issues. Also, as a result of inspections during 2003, work is planned for 2004 that will address deterioration along the line to Cape Ray at an estimated cost of \$100,000. This should have a positive impact on the reliability of the feeder.

During 2003, the unscheduled distribution outage statistics were 21,516 customer minutes, a SAIFI of 0.42 and a SAIDI of 0.80 hours.

GBY-02

Location: Supplies Carmanville, Frederickton & 3 other small communities in the Gander Bay Area

Feeder Statistics:

Number of Customers:	888			
Approximate Feeder Length	53.51	km (2000-2001 Survey)		
Average Annual Customer Minutes:	434,062	minutes	Ranking	12
Average Annual SAIFI:	3.45	interruptions	Ranking	19
Average Annual SAIDI:	8.18	hours	Ranking	6

Comments:

There are concerns about deterioration along this feeder. A detailed inspection was completed in 2004 to fully determine the extent of the deterioration and refine the scope of the work required. An upgrade of this feeder for 2005 (\$425,000) and 2006 (\$398,000) is planned to address areas where the conductor is deteriorated and long sections are in poor condition and inaccessible.

During 2003, the unscheduled distribution outage statistics were 649,720 customer minutes, a SAIFI of 2.47 and a SAIDI of 12.19 hours.

GBY-03

Location: Leaves Gander Bay substation and utilizes 129L across country and then supplies Aspen Cove, Ladle Cove, and Musgrave Harbour.

Feeder Statistics:

Number of Customers:	774			
Approximate Feeder Length	86.82	km (2000-2001 Survey)		
Average Annual Customer Minutes:	280,780	minutes	Ranking	28
Average Annual SAIFI:	1.64	interruptions	Ranking	97
Average Annual SAIDI:	5.98	hours	Ranking	21

Comments:

A voltage conversion was completed in Musgrave Harbour during 2003 and 2 piece insulators have been replaced on the trunk section. In 2006 (\$135,000) work is planned to replace the downline recloser with Nulec reclosers so that remote control can be established to assist in isolating faults and reduce outage duration, and to replace insulators and Ball Link Eyebolts to improve reliability.

During 2003, the unscheduled distribution outage statistics were 325,049 customer minutes, a SAIFI of 3.19 and a SAIDI of 6.99 hours.

GDL-06

Location: Along Old Placentia Road including Admiralty Wood Subdivision to Brookfield Road. All Brookfield Road including Sesame Park, Waterford Park Subdivision to Topsail Road and Waterford Heights.

Feeder Statistics:

Number of Customers:	1414			
Approximate Feeder Length	23.12	km (2000-2001 Survey)		
Average Annual Customer Minutes:	340,981	minutes	Ranking	21
Average Annual SAIFI:	2.11	interruptions	Ranking	53
Average Annual SAIDI:	3.80	hours	Ranking	44

Comments:

There are two small areas (Sesame Park and near the Experimental Farm) on this feeder that will have small upgrades done in 2005 to address the source of some recent problems on this feeder. A large upgrade of this feeder is not necessary.

During 2003, the unscheduled distribution outage statistics were 571,371 customer minutes, a SAIFI of 4.16 and a SAIDI of 6.73 hours.

GPD-01

Location: Supplies the area around Greenspond, Bonavista Bay

Feeder Statistics:

Number of Customers:	234			
Approximate Feeder Length	18.25	km (2000-2001 Survey)		
Average Annual Customer Minutes:	114,694	minutes	Ranking	82
Average Annual SAIFI:	1.99	interruptions	Ranking	64
Average Annual SAIDI:	8.34	hours	Ranking	4

Comments:

During 2002, all two-piece insulators were replaced on the feeder and a remotely operated recloser installed. The remaining two-piece and 8080 insulators will be replaced in 2004. This project will tend to improve the reliability of supply provided by this feeder.

The length of the power interruptions appears to be the main reason for the high SAIDI for this feeder, and this continued in 2003 with one outage representing 53% of the total 2003 minutes. During 2003, the unscheduled distribution outage statistics were 181,665 customer minutes, a SAIFI of 2.24 and a SAIDI of 12.94 hours.

HOL-02

Location: Supplies a substantial portion of the Town of Holyrood, Conception Bay and the load along the Holyrood Access Road.

Feeder Statistics:

Number of Customers:	383			
Approximate Feeder Length	20.39	km (2000-2001 Survey)		
Average Annual Customer Minutes:	335,481	minutes	Ranking	22
Average Annual SAIFI:	1.52	interruptions	Ranking	109
Average Annual SAIDI:	11.46	hours	Ranking	2

Comments:

The storm during April 1999 accounts for 1,414,080 customer minutes of outage, or 84.3% of the total minutes for the past 5 years. No need for a major upgrade of this feeder has been identified to address historic reliability performance. This feeder was inspected in 2004 under the FIP Program and the resulting work in 2005 should positively impact the reliability of this feeder.

During 2003, the unscheduled distribution outage statistics were 75,068 customer minutes, a SAIFI of 2.12 and a SAIDI of 3.26 hours.

HUM-09

Location: Supplies an area of central Corner Brook near Cobb Lane and West Valley Road

Feeder Statistics:

Number of Customers:	468			
Approximate Feeder Length	11.89	km (2000-2001 Survey)		
Average Annual Customer Minutes:	115,863	minutes	Ranking	80
Average Annual SAIFI:	4.95	interruptions	Ranking	4
Average Annual SAIDI:	4.43	hours	Ranking	35

Comments:

Tree contact continues to be a major source of problems on this feeder. The community desires the large trees in this urban area, however extensive tree trimming was completed on this feeder. We will continue to monitor this issue. A wind and snowstorm in Corner Brook during October 1999 caused 7 feeder interruptions, 20% of the interruptions recorded above, 1999 outages represent 40% of the total outages over the past 5 years. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 90,845 customer minutes, a SAIFI of 4.41 and a SAIDI of 3.23 hours. 70% of SAIFI and 95% of SAIDI for 2001 was caused by tree contact with the distribution lines.

HWD-07

Location: Supplies a large portion of Paradise and St. Thomas's on the Avalon Peninsula.

Feeder Statistics:

Number of Customers:	2026			
Approximate Feeder Length	42.49	km (2000-2001 Survey)		
Average Annual Customer Minutes:	434,800	minutes	Ranking	11
Average Annual SAIFI:	3.95	interruptions	Ranking	11
Average Annual SAIDI:	4.32	hours	Ranking	36

Comments:

This feeder is comprised of a significant amount of 'new feeder construction' – a new feeder was built in 2000 with portions of the new construction now part of HWD-08 and HWD-07. In addition, new relays are being installed in 2004 on this feeder. This feeder has performed poorly in 2000, 2001, and 2002 but had a better year in 2003. There is no need for major work on this feeder.

During 2003, the unscheduled distribution outage statistics were 330,398 customer minutes, a SAIFI of 3.06 and a SAIDI of 2.71 hours.

KEL-02

Location: Supplies a section of Conception Bay South from Middle Bight Road to Dunn's Hill Road.

Feeder Statistics:

Number of Customers:	1424			
Approximate Feeder Length	39.58	km (2000-2001 Survey)		
Average Annual Customer Minutes:	531,640	minutes	Ranking	6
Average Annual SAIFI:	2.36	interruptions	Ranking	45
Average Annual SAIDI:	6.12	hours	Ranking	18

Comments:

The average performance statistics for this feeder are poor due to the April 1999 snowstorm that accounted for 1,838,378 or 69% of the customer minutes above. Some small sections of the feeder were upgraded in 1999 along with some additional fusing to address the concerns identified during the 1999 storm. To deal with load growth in the Conception Bay South Area, the need to offload a section of this feeder onto CHA-01 has been identified. This is scheduled to be completed in 2004 at an estimated cost of \$183,000. The feeder was inspected in 2004 under the FIP program. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 369,906 customer minutes, a SAIFI of 4.58 and a SAIDI of 4.33 hours.

KEN-04

Location: This feeder runs along Kenmount Road, over Kenmount Hill to Blackmarsh Road bordering Cowan Heights Subdivision from Blackmarsh Road down Canada Drive to Cowan Heights School along Frecker Drive to Captain Whalen Drive.

Feeder Statistics:

Number of Customers:	2245			
Approximate Feeder Length	23.30	km (2000-2001 Survey)		
Average Annual Customer Minutes:	320,052	minutes	Ranking	25
Average Annual SAIFI:	2.57	interruptions	Ranking	35
Average Annual SAIDI:	2.52	hours	Ranking	93

Comments:

This feeder's performance during 2003 was poor with totals for Minutes, SAIFI, and SAIDI greater than any of the other 4 years by a considerable margin. A single event in on December 8, 2003 resulted in 630,854 minutes, or 39.5% of the total minutes for the past 5 years. This feeder was inspected under the FIP program for 2004 and the resulting work will follow in 2005. In addition, after an outage in January 2004, a troublesome area was upgraded (at a cost of approximately \$8000). Both these items should improve reliability.

The 2003 totals were 715,095 outage minutes, SAIFI 5.47, and SAIDI 5.31 hours.

LET-01

Location: Supplies the Area around Lethbridge, Bonavista Bay, including the area between Bunyans Cove to Jamestown and Charlottetown.

Feeder Statistics:

Number of Customers:	1864			
Approximate Feeder Length	102.46	km (2000-2001 Survey)		
Average Annual Customer Minutes:	345,731	minutes	Ranking	19
Average Annual SAIFI:	2.17	interruptions	Ranking	49
Average Annual SAIDI:	3.19	hours	Ranking	66

Comments:

During 2001 deteriorated insulators were replaced along with deteriorated conductor along a 3 km section of the line. During 2002 the remaining two-piece insulators were replaced. This feeder requires no major work. During 2003, the unscheduled distribution outage statistics was 411,781 customer minutes, a SAIFI of .58 and a SAIDI of 3.74 hours.

LEW-02

Location: From the Town of Lewisporte to the TCH at Lewisporte Junction and from the Town of Lewisporte along the Road to the Isles as far as Birchy Bay (A total of 8 communities)

Feeder Statistics:

Number of Customers:	1513			
Approximate Feeder Length	109.55	km (2000-2001 Survey)		
Average Annual Customer Minutes:	572,409	minutes	Ranking	4
Average Annual SAIFI:	3.98	interruptions	Ranking	10
Average Annual SAIDI:	6.33	minutes	Ranking	17

Comments:

In the past couple of years, all the defective insulators on the feeder were replaced. An inspection scheduled for 2005 will focus on identifying deteriorated plant. In the future, consideration should be given to installing remotely operated Nulec reclosers along the feeder to minimize the impact of the failure of a component on the feeder.

For 2003 this feeder recorded 728,488 customer minutes of outage, a SAIFI of 3.37 and a SAIDI of 8.02. However 207,295 (28.45%) customer minutes were the result of animals or birds causing problems on the line. Another unexplained feeder trip resulted in 206,586 minutes (28.35%) minutes.

LGL-01

Location: Supplies the Southwest coast of Newfoundland in the area of Margaree and Isle Aux Morts

Feeder Statistics:

Number of Customers:	355			
Approximate Feeder Length	14.19	km (2000-2001 Survey)		
Average Annual Customer Minutes:	64,211	minutes	Ranking	133
Average Annual SAIFI:	3.19	interruptions	Ranking	21
Average Annual SAIDI:	2.20	hours	Ranking	108

Comments:

Upgrading in 1999 totaled \$103,000. This feeder was inspected in 2004 with plans to replace some main line two-piece clamp-top insulators in 2005. In the Isle Aux Morts area an

engineering analysis will be completed in 2005 to determine the scope of work for a planned upgrade in 2006 (\$70,000).

During 2003, the unscheduled distribution outage statistics were 9349 customer minutes, a SAIFI of 2.09 and SAIDI of .45 hours.

LOK-01

Location: Services the area from Lockston to New Bonaventure and Port Rexton to English Harbour.

Feeder Statistics:

Number of Customers:	1036			
Approximate Feeder Length	67.36	km (2000-2001 Survey)		
Average Annual Customer Minutes:	232,215	minutes	Ranking	35
Average Annual SAIFI:	3.12	interruptions	Ranking	23
Average Annual SAIDI:	3.72	hours	Ranking	47

Comments:

This feeder experienced several outages related to equipment failure during 2003 which accounted for 65% of the SAIDI figure. One outage in 2003 caused by a faulty cutout resulted in 43% of the minutes in 2003 and 9% of the minutes in the five year total. This feeder is scheduled for an inspection in 2005 with the associated work being completed in 2006. No need for a significant feeder upgrade has been identified.

During 2003, the unscheduled distribution outage statistics were 242,542 customer minutes, a SAIFI of 3.16 and SAIDI of 3.90 hours.

PEP-01

Location: Supplies a section of St. John's in the area of Pleasantville and Logy Bay Road.

Feeder Statistics:

Number of Customers:	1160			
Approximate Feeder Length	14.35	km (2000-2001 Survey)		
Average Annual Customer Minutes:	566,472	minutes	Ranking	5
Average Annual SAIFI:	3.77	interruptions	Ranking	14
Average Annual SAIDI:	6.90	hours	Ranking	15

Comments:

The performance numbers of this feeder are poor due to the April 1999 snowstorm that accounted for 967,076 or 34% of the customer minutes above. In 2000 one section, approximately 20 spans, was rebuilt. The replacement of padmounts and associated connections at Hillview Terrace will be completed in 2005 as part of the Distribution Feeder Rebuild project to address some of the issues with reliability on this feeder. During 2003, the unscheduled distribution outage statistics were 361,456 customer minutes, a SAIFI of 2.87 and a SAIDI of 5.19 hours.

PUL-01

Location: Supplies the Torbay and Bauline Areas

Feeder Statistics:

Number of Customers:	1985			
Approximate Feeder Length	48.73	km (2000-2001 Survey)		
Average Annual Customer Minutes:	672,375	minutes	Ranking	2
Average Annual SAIFI:	2.62	interruptions	Ranking	32
Average Annual SAIDI:	5.71	hours	Ranking	22

Comments:

Recent outages appear to be the result of conductor related problems and a loading problem on reclosers. A new feeder is being built in 2004 to address reliability, customer growth and load growth on PUL-01 and PUL-02 at an estimated cost of \$190,000. This new feeder will supply a portion of the customers on PUL-01 and PUL-02. This will reduce customer exposure to trouble on the distribution system while improving the reliability of the feeder.

During 2003, the unscheduled distribution outage statistics were 1,168,400 customer minutes, a SAIFI of 4.92 and a SAIDI of 9.81 hours.

PUL-02

Location: Supplies an area north of St. John's from Torbay to Pouch Cove

Feeder Statistics:

Number of Customers:	1449			
Approximate Feeder Length	60.42	km (2000-2001 Survey)		
Average Annual Customer Minutes:	486,796	minutes	Ranking	8
Average Annual SAIFI:	2.97	interruptions	Ranking	26
Average Annual SAIDI:	5.61	hours	Ranking	24

Comments:

Of the past 10 years there were significant reliability problems only during 1999 and 2000. The problems were partially due to one location that was fixed during 2000. Also, a new feeder is being built in 2004 to address reliability, customer growth and load growth on PUL-01 and PUL-02 at an estimated cost of \$190,000. This new feeder will supply a portion of the customers on PUL-01 and PUL-02. This will reduce customer exposure to trouble on the distribution system. In addition, this feeder is scheduled for FIP work in 2004. All these items should improve the reliability of the feeder.

During 2003, the unscheduled distribution outage statistics were 271,794 customer minutes, a SAIFI of 1.09 and a SAIDI of 3.13 hours.

QTZ-01

Location: Former site of Quarry Mine off Argentia Access Road. Three customers remain on this feeder.

Feeder Statistics:

Number of Customers:	3			
Approximate Feeder Length	0.71	km (2000-2001 Survey)		
Average Annual Customer Minutes:	1298.40	minutes	Ranking	271
Average Annual SAIFI:	0.13	interruptions	Ranking	282
Average Annual SAIDI:	7.21	hours	Ranking	12

Comments:

Only one outage has been attributed to the distribution system. The outage occurred during the April 1999 storm. Other priorities resulted in repairs being completed 54 hours after the interruption occurred. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, there were no unscheduled distribution outages.

RRD-09

Location: Supplies the Airport Heights area of St. John's.

Feeder Statistics:

Number of Customers:	1204			
Approximate Feeder Length	26.68	km (2000-2001 Survey)		
Average Annual Customer Minutes:	355,404	minutes	Ranking	18
Average Annual SAIFI:	2.02	interruptions	Ranking	62
Average Annual SAIDI:	5.56	minutes	Ranking	26

Comments:

A storm in April 1999 caused 2 interruptions totaling 1,454,204 customer minutes of outages, 81.8% of the five-year average above. No need for a major upgrade of this feeder has been identified to address historic reliability performance. However, there is currently a new filtration plant being constructed at the end of this feeder that will require 2-3MVA of load. This feeder will undergo significant analysis and resulting work in 2005 to accommodate this addition.

During 2003, the unscheduled distribution outage statistics were 113,589 customer minutes, a SAIFI of 1.10 and a SAIDI of 1.46hours.

SCV-01

Location: Supplies a section of Conception Bay South from the Seal Cove Substation to Kelligrews

Feeder Statistics:

Number of Customers:	1611			
Approximate Feeder Length	41.92	km (2000-2001 Survey)		
Average Annual Customer Minutes:	401,901	minutes	Ranking	15
Average Annual SAIFI:	2.53	interruptions	Ranking	39
Average Annual SAIDI:	4.77	hours	Ranking	29

Comments:

During 1999, one storm caused 818,088 customer minutes of outage, 41% of the total for five years. Some minor work was completed in 2000 to address trouble experienced in 1999 and 2000. Due to load growth in Conception Bay South, the need to transfer a portion of this feeder onto KEL-01 will be addressed in 2004 at an estimated cost of \$183,000. This feeder was also inspected under the FIP Program in 2004. No need for a significant feeder upgrade has been identified.

During 2003, the unscheduled distribution outage statistics were 147,448 customer minutes, a SAIFI of 1.23 and a SAIDI of 1.53 hours.

SMV-01

Location: Supplies the Bonavista Bay side of the Bonavista Peninsula from Charleston to Hodderville

Feeder Statistics:

Number of Customers:	1009			
Approximate Feeder Length	97.79	km (2000-2001 Survey)		
Average Annual Customer Minutes:	441,588	minutes	Ranking	10
Average Annual SAIFI:	3.66	interruptions	Ranking	16
Average Annual SAIDI:	7.22	minutes	Ranking	11

Comments:

In 2003 lightning arrestors were installed on 50% of the transformers on SMV-01 feeder. The remainder will be completed in 2004. Feeder inspection during 2003 identified the need to replace 18 support structures along this feeder. Replacing the structures has been included as part of the FIP program for 2004. In addition, clamp top insulators will be installed at several locations on the feeder in 2005.

For 2003 there was 781,563 customer minutes of outage, a SAIFI of 3.84 and a SAIDI of 12.9 hours.

SPF-02

Location: This feeder services the towns of Brigus, Cupids, Cupids Crossing, Makinsons, Turk's Water, Roaches Line and Hodgewater Line

Feeder Statistics:

Number of Customers:	1543			
Approximate Feeder Length	76.19	km (2003 Survey)		
Average Annual Customer Minutes:	329,307	minutes	Ranking	23
Average Annual SAIFI:	1.77	interruptions	Ranking	87
Average Annual SAIDI:	3.66	hours	Ranking	49

Comments:

A storm in 1999 resulted in 879,091 minutes (53%) of the total minutes for this feeder. No major upgrade of this feeder is planned.

During 2003, the unscheduled distribution outage statistics were 378,441 customer minutes, a SAIFI of 2.26 and a SAIDI of 4.09 hours.

SPR-03

Location: Near Springdale serving Newfoundland Hydro and 2 cabins in the area

Feeder Statistics:

Number of Customers:	3			
Approximate Feeder Length	16.13	km (2000-2001 Survey)		
Average Annual Customer Minutes:	1640	minutes	Ranking	269
Average Annual SAIFI:	1	interruption	Ranking	102
Average Annual SAIDI:	6.21	hours	Ranking	3

Comments:

This line serves NF Hydro and its some of its customers on the Baie Verte peninsula. A major rebuild was performed on the feeder in 2003. No need for a significant feeder upgrade has been identified beyond the 2003 rebuild.

During 2003, the unscheduled distribution outage statistics were 3326 customer minutes, a SAIFI of 2 and a SAIDI of 27.7 hours. A major outage occurred on the feeder in 2003 just prior to the rebuild.

STG-01

Location: Area of St. George's north to Barachois Brook.

Feeder Statistics:

Number of Customers:	321			
Approximate Feeder Length	11.43	km (2000-2001 Survey)		
Average Annual Customer Minutes:	64,836	minutes	Ranking	131
Average Annual SAIFI:	4.70	interruptions	Ranking	5
Average Annual SAIDI:	3.54	hours	Ranking	54

Comments:

In 1999 there were 21 short interruptions due to salt contamination during two windstorms. This represents about 89% of the SAIFI statistic for the feeder. No need for a major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 45,581 customer minutes, a SAIFI of .05 and a SAIDI of 2.36 hours.

STG-02

Location: Supplies an Area around St. George's to Shallop Cove

Feeder Statistics:

Number of Customers:	435			
Approximate Feeder Length	24.09	km (2000-2001 Survey)		
Average Annual Customer Minutes:	106,108	minutes	Ranking	88
Average Annual SAIFI:	5.12	interruptions	Ranking	3
Average Annual SAIDI:	3.92	hours	Ranking	40

Comments:

In 1999 there were 20 short interruptions due to salt contamination during two windstorms. This represents about 70% of the SAIFI statistic for the feeder. Area staff has a concern with the age of the feeder so this feeder will be inspected and an engineering analysis will be completed in 2005. A project to perform significant reconductoring and pole replacement has been identified for 2006 (\$400,000).

During 2003, the unscheduled distribution outage statistics were 6366 customer minutes, a SAIFI of .12 and a SAIDI of .24 hours.

STX-01

Location: Supplies Stephenville Crossing, to Mattis Point and Black Duck Siding.

Feeder Statistics:

Number of Customers:	1013			
Approximate Feeder Length	39.87	km (2000-2001 Survey)		
Average Annual Customer Minutes:	143,408	minutes	Ranking	65
Average Annual SAIFI:	5.72	interruptions	Ranking	2
Average Annual SAIDI:	2.53	hours	Ranking	91

Comments:

There were 24 feeder interruptions due to salt contamination from two windstorms during 1999. This accounts for 84% of the interruption frequency. No need for a major upgrade of this feeder has been identified to address historic reliability performance. A feeder inspection in 2003 identified some deficiencies that will be corrected in 2004.

During 2003, the unscheduled distribution outage statistics were 6365 customer minutes, a SAIFI of .12 and a SAIDI of .24 hours.

SUM-01

Location: Supplies Summerford to Tizzard's Harbour and Herring Neck on New World Island.

Feeder Statistics:

Number of Customers:	1776			
Approximate Feeder Length	91.67	km (2000-2001 Survey)		
Average Annual Customer Minutes:	403,661	minutes	Ranking	14
Average Annual SAIFI:	1.54	interruptions	Ranking	108
Average Annual SAIDI:	4.59	hours	Ranking	30

Comments:

One outage during 1999 accounts for 704,052 customer minutes or 34.8% of the total above. Recent upgrading included replacement of a large portion of the defective insulators along the main trunk of the feeder. A feeder inspection during 2003 has identified a large number of deficiencies that have been 80% completed and will be finished in 2004. These measures will positively impact reliability going forward.

During 2003, the unscheduled distribution outage statistics were 206,544 customer minutes, a SAIFI of 3.10 and a SAIDI of 5.06 hours.

SUM-02

Location: Supplies the communities of Summerford, Boyd's Cove, Horwood, Stoneville, and Port Albert.

Feeder Statistics:

Number of Customers:	576			
Approximate Feeder Length	65.57	km (2000-2001 Survey)		
Average Annual Customer Minutes:	261,382	minutes	Ranking	31
Average Annual SAIFI:	3.19	interruptions	Ranking	22
Average Annual SAIDI:	6.04	hours	Ranking	20

Comments:

This feeder is scheduled for inspection under the FIP program for 2004 and any identified deficiencies will be addressed in 2005.

During 2003, the unscheduled distribution outage statistics were 286,386 customer minutes, a SAIFI of 3.29 and a SAIDI of 8.28 hours.

TRP-01

Location: Town of Trepassey, east to Portugal Cove South and Cape Race and west to St. Shott's.

Feeder Statistics:

Number of Customers:	681			
Approximate Feeder Length	92.40	km (2000-2001 Survey)		
Average Annual Customer Minutes:	91,054	minutes	Ranking	103
Average Annual SAIFI:	2.98	interruptions	Ranking	25
Average Annual SAIDI:	2.23	minutes	Ranking	105

Comments:

In 2002, extensive upgrading of the feeder was completed on the single-phase line to St. Shotts. In 2003, a portion of the main line in Trepassey was reinsulated and reconductored.

During 2003, the unscheduled distribution outage statistics were 142,915 customer minutes, a SAIFI of 2.60 and a SAIDI of 3.54 hours.

TRP-02

Location: Supplies three customers at the Loran C site.

Feeder Statistics:

Number of Customers:	3			
Approximate Feeder Length	18.98	km (2000-2001 Survey)		
Average Annual Customer Minutes:	8709.8	minutes	Ranking	237
Average Annual SAIFI:	2.85	interruptions	Ranking	29
Average Annual SAIDI:	37.35	hours	Ranking	1

Comments:

The customers along this feeder are all communications towers with generation backup. The generation comes on automatically so when there is an outage, repairs are often delayed due to higher priority problems. No need for a major upgrade of this feeder has been identified to address historic reliability performance. During 2003, the unscheduled distribution outage statistics were 7669 customer minutes, a SAIFI of 2.33 and a SAIDI of 42.61 hours.

VIR-01

Location: Snow's Lane to Logy Bay Road to Logy Bay including Marine Drive, Cadigan's Road and also to Cambridge Avenue and East Meadows

Feeder Statistics:

Number of Customers:	874			
Approximate Feeder Length	34.40	km (2000-2001 Survey)		
Average Annual Customer Minutes:	305,215	minutes	Ranking	26
Average Annual SAIFI:	2.37	interruptions	Ranking	44
Average Annual SAIDI:	5.56	hours	Ranking	25

Comments:

This feeder is included in the FIP program and was inspected in 2004 with the resulting work planned for 2005 that should impact reliability.

During 2003, the unscheduled distribution outage statistics were 288,224 customer minutes, a SAIFI of 2.27 and a SAIDI of 5.49 hours.

WES-01

Location: Supplies the area of Wesleyville & Brookfield, Bonavista Bay.

Feeder Statistics:

Number of Customers:	393			
Approximate Feeder Length	11.55	km (2000-2001 Survey)		
Average Annual Customer Minutes:	184,649	minutes	Ranking	49
Average Annual SAIFI:	2.54	interruptions	Ranking	38
Average Annual SAIDI:	7.76	hours	Ranking	9

Comments:

By the end of 2003, the Company had replaced all the defective insulators on this feeder. No need for a major upgrade of this feeder has been identified to address historic reliability performance. An inspection associated with the FIP program was completed in 2004.

During December 2002, one outage due to a burnt off phase conductor was 20 hours in duration. It represents 61% of the five-year average SAIDI statistic. During 2003, the unscheduled distribution outage statistics were 1750 customer minutes, a SAIFI of 1.02 and a SAIDI of .07 hours.

WES-02

Location: Area north of Wesleyville, from Pound Cove to Deadman's Bay

Feeder Statistics:

Number of Customers:	760			
Approximate Feeder Length	49.14	km (2000-2001 Survey)		
Average Annual Customer Minutes:	366,753	minutes	Ranking	16
Average Annual SAIFI:	3.94	interruptions	Ranking	12
Average Annual SAIDI:	8.04	hours	Ranking	7

Comments:

This feeder has been performing poorly over the past few years. An engineering review of the feeder has identified the need to upgrade the standard of construction along a number of sections of this line. For 2004 and 2005, the plan is to upgrade the feeder to address accessibility and adequacy of line construction standards. The estimated costs are \$700,000 in 2004, and \$400,000 in 2005.

During 2003, the unscheduled distribution outage statistics were 617,495 customer minutes, a SAIFI of 3.96 and a SAIDI of 13.54 hours.

WES-03

Location: Area south of Wesleyville from Valleyfield to Badgers Quay

Feeder Statistics:

Number of Customers:	517			
Approximate Feeder Length	17.83	km (2000-2001 Survey)		
Average Annual Customer Minutes:	240,089	minutes	Ranking	33
Average Annual SAIFI:	1.94	interruptions	Ranking	68
Average Annual SAIDI:	7.71	hours	Ranking	10

Comments:

During 2003, defective insulators and crossarms were replaced on approximately 80 structures along the feeder. No other major upgrade of this feeder has been identified to address historic reliability performance.

During 2003, the unscheduled distribution outage statistics were 128,807 customer minutes, a SAIFI of 3.82 and a SAIDI of 4.15 hours.

Appendix C

List of projects for Inclusion in Five-Year Capital Forecast

Through reviewing the power interruption statistics and discussions with field staff, the following projects have been identified for inclusion in the 2005 budget or five year forecast in order to improve the reliability performance of their respective feeders.

- BHD-01 - A deteriorated section of line in the area of Pinetree area will be upgraded. (\$400,000) (2006)
- BRB-04 - Outages in 2002 brought attention to 2 sections of the feeder which are to be upgraded. (\$120,000) (2004 project deferred to 2005)
- BUC-02 - Insulator replacement. (\$100,000) (2006 – Rebuild Distribution Lines Project)
- DLK-03 - Relocate lines from isolated areas and large trees which cannot be trimmed because they form a wind break for local farms. (\$300,000) (2006)
- GBY-02 - Upgrade the feeder to address deterioration and adequacy of line construction. A detailed engineering assessment has concluded that the work will cost approximately \$465,000 in 2005 and \$398,000 in 2006.
- GBY-03 - The downline recloser needs to be replaced with NuLec reclosers so that remote control can be established to assist in isolating faults and reduce outage duration, and the insulators and BLE's will be changed. (\$135,000) (2006 – Rebuild Distribution Lines Project)
- LGL-01 - Engineering analysis in 2005 will determine the detailed estimate for work required in the area of Isle Aux Morts. A preliminary estimate has been included in the forecast for 2006. (\$70,000)
- STG-02 - Engineering analysis in 2005 will determine the detailed estimate for reconductoring and pole replacement. A preliminary estimate has been included in the forecast for 2006. (\$400,000)
- WES-02 - Upgrade the feeder to address accessibility and adequacy of line construction standards. Overall project estimate is approximately \$1.1 million. (700,000 – 2004) (407,000 – 2005)

Feeders to be inspected from which major reliability upgrades may result.

- BOT-01 - Review again in 2005 and review the need and priority for relocating a section of the line to poles recently installed by Aliant.
- LEW-02 - Review the potential benefits of installing remotely operated reclosers to improve response times for outages.