



Preliminary 2011 Revenue Requirements

Appendix F

**Distribution Substation Automation
Effectiveness Report**

1 **Distribution Substation Automation (“DSA”) Annual Program**
2 **Effectiveness Report**

3 **Direct Reliability Improvements**

4 Direct reliability improvements include reductions in SAIDI, SAIFI, and Customer
5 Average Interruption Duration Index (“CAIDI”). At this time there is nothing to report as
6 there is insufficient data from the program to determine detailed reliability
7 improvements.

8 The ability to view individual feeder loadings in real-time has allowed FortisBC staff to
9 optimize the available distribution system capacity. Rather than reacting to outages
10 caused by unexpected feeder overloads, proactive measures such as load transfers
11 prevented any feeder overload outages from occurring during these recent peak
12 periods.

13 **Reduction of Travel Costs**

14 A reduction of travel costs is accomplished by reducing crew vehicle usage. It is
15 estimated that vehicle costs have been reduced by approximately \$76,498 to date, as
16 seen in Table 1 below.

Table 1: Reduction of Travel Costs

Station	Date of Automation	Return Trip Time (Min)	Time Saved After Automation (Hrs)	Hourly Service Truck Rate	Reduction of Travel Costs
Keremeos	6-Sep-07	90	348	\$37	\$12,876
Saucier	31-Dec-07	60	141	\$37	\$5,217
Fruitvale	24-Oct-08	120	246	\$37	\$9,102
Castlegar	24-Nov-08	30	61.5	\$37	\$2,276
Duck Lake	4-Dec-08	90	102	\$37	\$3,774
Bell Terminal	10-Dec-08	60	312	\$37	\$11,544
Valhalla	8-Jun-09	180	165	\$37	\$6,105
OK Mission	11-Jun-09	60	222	\$37	\$8,214
Hollywood	18-Jun-09	60	204	\$37	\$7,548
Passmore	2-Jul-09	120	188	\$37	\$6,956
Blueberry	4-Aug-09	30	19	\$37	\$703
Summerland	14-Oct-09	100	0	\$37	\$0
Glenmore	9-Dec-09	60	44	\$37	\$1,628
Playmor	28-May-10	60	12	\$37	\$444
Huth	11-Jun-10	70	0	\$37	\$0
Christina Lake	21-Jul-10	60	3	\$37	\$111
Total			2067.5		\$76,498

1 **Safety Improvements**

2 Employee safety has improved due to reduced travel during adverse weather
3 conditions.

4 After implementation of the program improvements at Substations enhanced visibility is
5 provided by transformer load monitoring equipment. This enhanced remote visibility
6 provides notice of faulty conditions which could indicate transformer failure. This allows
7 offload and inspection of the transformer and prevents minor problems from escalating
8 into a major failure.

9

10 **Improved Operating Efficiency**

11 Reduced recloser tagging costs is the primary driver in improving operating efficiency.
12 Recloser tagging costs are estimated to have been reduced by approximately \$147,000
13 to date. Detailed savings are displayed in Table 2 below.

Table 2: Improved Operating Efficiency after Automation

Station	Date of Automation	Time Saved After Automation (Hrs)	Hourly Crew PLT Rate (Blended)	Improved Operating Efficiency After Automation
Keremeos	6-Sep-07	348	\$71	\$24,708
Saucier	31-Dec-07	141	\$71	\$10,011
Fruitvale	24-Oct-08	246	\$71	\$17,466
Castlegar	24-Nov-08	61.5	\$71	\$4,367
Duck Lake	4-Dec-08	102	\$71	\$7,242
Bell Terminal	10-Dec-08	312	\$71	\$22,152
Valhalla	8-Jun-09	165	\$71	\$11,715
OK Mission	11-Jun-09	222	\$71	\$15,762
Hollywood	18-Jun-09	204	\$71	\$14,484
Passmore	2-Jul-09	188	\$71	\$13,348
Blueberry	4-Aug-09	19	\$71	\$1,349
Summerland	14-Oct-09		\$71	\$0
Glenmore	9-Dec-09	44	\$71	\$3,124
Playmor	28-May-10	12	\$71	\$852
Huth	11-Jun-10	0	\$71	\$0
Christina Lake	21-Jul-10	3	\$71	\$213
Total		2067.5		\$146,793

- 1 Based upon the previous three years, the average improved operating efficiency per
 2 year is presently estimated at \$130,000 for Stations currently in service, as
 3 demonstrated in Table 3.

Table 3: Average Improved Operating Efficiency

Station	Number of GNRs 2007	Number of GNRs 2008	Number of GNRs 2009	Number of GNRs 2010	Average Number of GNRs Per Year	Average Time Saved Per Year After Automation (Hrs / Yr)	Average Improved Operating Efficiency Per Year
Keremeos	55	36	55	106	48.7	73.0	\$7,530.0
Saucier	25	36	62	43	41.0	41.0	\$4,229.2
Fruitvale	75	47	15	79	45.7	91.3	\$9,421.0
Castlegar	45	119	51	56	71.7	35.8	\$3,696.2
Duck Lake	50	168	47	9	88.3	132.5	\$13,667.4
Bell Terminal	76	78	91	213	81.7	81.7	\$8,423.9
Valhalla	5	5	246	7	85.3	256.0	\$26,406.4
OK Mission	97	154	170	170	140.3	140.3	\$14,475.4
Hollywood	73	83	151	151	102.3	102.3	\$10,555.7
Passmore	6	16	15	15	12.3	24.7	\$2,544.4
Blueberry	42	34	15	33	30.3	15.2	\$1,564.4
Summerland	0	0	0	0	0.0	0	
Glenmore	62	14	36	31	37.3	37.3	\$3,850.9
Playmor	42	171	247	22	153.3	153.3	\$15,816.3
Huth	0	0	0	0	0.0	0.0	\$0.0
Christina Lake	25	130	52	6	69.0	69.0	\$7,117.4
Total	678	1091	1253	941	1007.3	1253.5	\$129,299

- 4 **Identification of Reduction System Losses and Peak Demand by Power Factor**
 5 **Improvement**
 6 At this time there is nothing to report. There is insufficient data from the program to
 7 determine system reduction losses.

1 **Summary of Substation Alarms, Outcomes and Response Time**

2 At present the electronic log of substation alarms is kept for 45 days by the FortisBC
3 System Control centre. Response time is not tracked. Once implemented the Data
4 Historian component of the program will provide this information.

5 With the stations now automated through the Station Automation project alarms related
6 to operational and equipment concerns are now available to FortisBC operations
7 personnel immediately when they occur. These alarms have a priority rating related to
8 their required response times. Prior to the Station Automation project these type of
9 alarms could only be collected manually by personnel visiting the station. At this time
10 there is no actual data to report in this area.

11 **Guarantee of Non Reclose (“GNR”) Permits Issued by Remote-Control**

12 To date 1671 GNR permits have been issued by remote-control. See Table 4 below.

Table 4: Average GNR Permits per Year

Station	Date of Automation	Number of GNRs Before Station Automation	Number of GNRs After Station Automation	Number of GNRs 2007	Number of GNRs 2008	Number of GNRs 2009	Number of GNRs 2010	Average Number of GNRs Per Year
Keremeos	6-Sep-07	20	232	55	36	55	106	48.7
Saucier	31-Dec-07	26	141	25	36	62	43	41.0
Fruitvale	24-Oct-08	206	123	75	47	15	79	45.7
Castlegar	24-Nov-08	460	123	45	119	51	56	71.7
Duck Lake	4-Dec-08	206	68	50	168	47	9	88.3
Bell Terminal	10-Dec-08	150	312	76	78	91	213	81.7
Valhalla	8-Jun-09	301	55	5	5	246	7	85.3
OK Mission	11-Jun-09	297	222	97	154	170	170	140.3
Hollywood	18-Jun-09	304	204	73	83	151	151	102.3
Passmore	2-Jul-09	363	94	6	16	15	15	12.3
Blueberry	4-Aug-09	249	38	42	34	15	33	30.3
Summerland	14-Oct-09			0	0	0	0	0.0
Glenmore	9-Dec-09	159	44	62	14	36	31	37.3
Playmor	28-May-10	1028	12	42	171	247	22	153.3
Huth	11-Jun-10	1	0	0	0	0	0	0.0
Christina Lake	21-Jul-10	353	3	25	130	52	6	69.0
Total		4123	1671	678	1091	1253	941	1007

13 **System Loss Analysis Report**

14 At this time there is insufficient data from the program to determine system losses.