

Rule 004 Reference material

Former Appendices A, C, D, E, F, G, H and I from version 1.4 of AUC Rule 004 Alberta Tariff Billing Code Rules, which were moved from the rule to the website after version 2.0 was released on April 1, 2015.

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Reference A Estimation Methodology & Validation Thresholds

In the absence of a standard market estimation approach, the purpose of Appendix A is to provide retailers in the Alberta electricity and natural gas markets with visibility into the methodologies, variables, and thresholds employed by distributors in the production of usage estimates where actual meter reads are not available.

A1 ATCO Electric Limited

A1.1 Estimation methodology

ATCO-CIS ESTIMATING FACTORS

Heat Sensitive Estimate Factor

If the site usage is heat sensitive, the following components are used in the calculation of the estimating factor:

Degree Days

Base Load Percentage (currently set at 74% Gas and 77.2% Electric)

Heat Load Percentage (currently set at 26% Gas and 22.8% Electric)

The calculation of the Heat Sensitive Estimating Factor for 30-day charge period is:

$$((\text{Degree Days in Period} / \text{Degree Days for previous year}) * \text{Heat Load}) + ((\% \text{ Of Base Load} / 365) * \text{Number of Days in Period})$$

ATCO CIS calculates the estimate factor at cycle billing time. The estimate factor is based on 30-day billing period.

Non-Heat Sensitive Estimate Factor

If the site usage is non-heat sensitive, ATCO Gas and ATCO Electric determine the estimate factors. Each day the estimating factor is entered into ATCO-CIS to be used for cycle billing. The estimate factors are based on 30-day charge period.

ESTIMATED ENERGY CALCULATION

In ATCO-CIS, energy consumption is estimated when actual meter reading is not available for usage calculation. The estimated consumption is calculated as:

Estimating Factor = See formula above for heat sensitive and non-heat sensitive services

Raw Estimate (30 days) = Annual Consumption * Estimating Factor for Usage Period

Raw Estimate (actual days) = Raw Estimate (30 days)/30 * Number of Days in Charge Period

Net Reading Conversion = Raw Estimate / Billing Constant

Estimated Consumption = Reading Conversion * Billing Constant

Example of Estimating Consumption

	GAS	ELECTRIC
Days in Charge Period	29 days	29 days
Annual Consumption:	150 GJ	3500 kWh
Estimating Factor	.171	.145
Billing Constant	1.05462	1.0
Raw Estimate (30 days)	$150 * .171 = 25.65$ GJ	$3500 * .145 = 507.50$ kWh
Raw Estimate (actual days)	$25.65 / 30 * 29 = 24.80$ GJ	$507.50 / 30 * 29 = 490.58$ kWh
Net Reading Estimate	$24.80 / 1.05462 = 23.51$	$490.58 * 1 = 490.58$
Estimated Consumption	$24 * 1.05462 = 25$ GJ	$491 * 1 = 491$ kWh

Annual Consumption

ATCO CIS has the capability to keep two sets of Annual consumption. One is the Manually Entered Annual Consumption and the other is the System Calculated Annual Consumption. Annual consumption is used in estimating usage when an actual meter reading is not available. Annual consumption data stays with the service site. Therefore, customers moving from one location to another will inherit the annual consumption of the new site.

Manually Entered Annual Consumption

Generally, Manually Entered Annual Consumption can be entered into ATCO CIS and override the System Calculated Annual Consumption for a period of time. During that time, ATCO CIS will use the Manually Entered Annual Consumption for usage estimation. At the same time, ATCO CIS will continue to update the System Calculated Annual Consumption. The following examples are situations when Manually Entered Annual Consumption is used:

- New site without enough history to calculate annual consumption
- The consumption pattern of the site changed and the current System Calculated Annual Consumption based on past history no longer represents the current usage pattern

In most case, the manually entered annual consumption will be in effect for 180 days and then the system will switch to using system calculated annual consumption.

System Calculated Annual Consumption

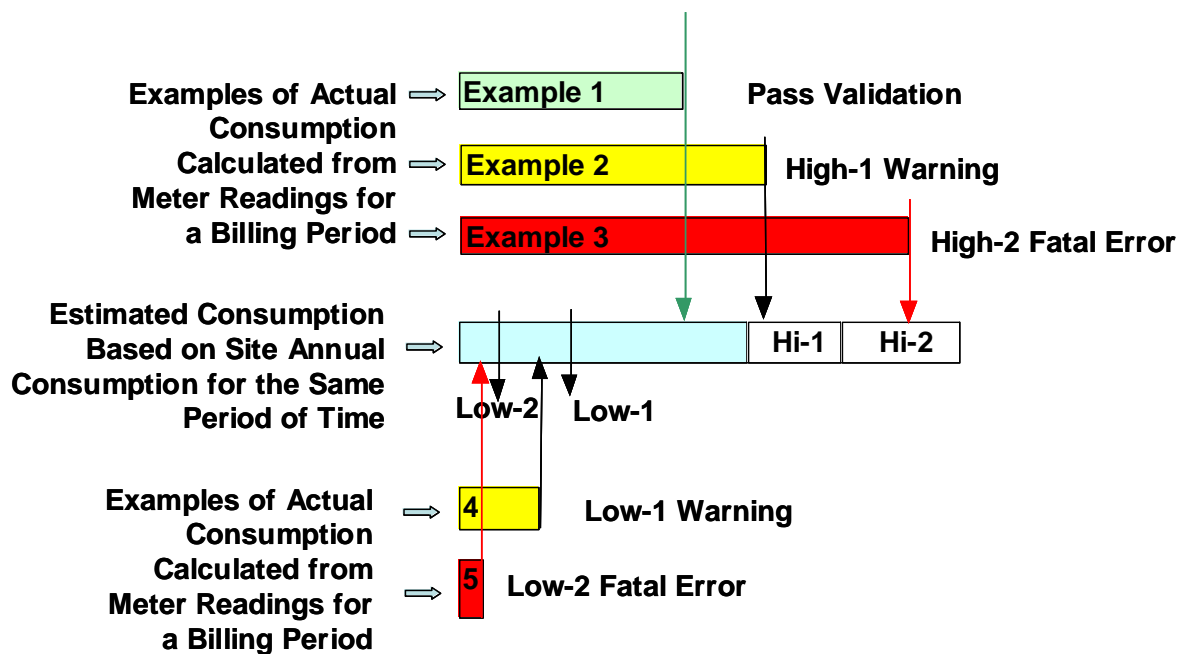
ATCO CIS updates the System Calculated Annual Consumption for a site whenever an actual usage is used for charge calculation. The System Calculated Annual Consumption is a rolling 12-month accumulated consumption for a site. ATCO CIS totals 12 months or up to 425 days of consumption or as much history available (if less than 12 months).

System Calculated Annual Consumption =
 (Total consumption accumulated/Total number of days usage is accumulated) *365

A1.2 Meter Read Validation Thresholds

ATCO's philosophy behind the energy consumption high-low verification is to compare the actual measured consumption to an estimated consumption for the same period based on the site consumption history. If the actual consumption is outside of the tolerance ranges ATCO CIS will either generate a warning or fatal error for the meter reading. A warning means that the consumption requires review but will be used for billing. A fatal error means the consumption requires investigation and will **not** be used for billing.

Meter Read Validation in ATCO CIS



Here are some definitions of terms:

- **Annual Consumption:** The 365 days of system calculated energy consumption for a site based on actual usage received from MDM. Manual estimated annual consumption can be determined if there is not enough consumption history available for the site
- **Estimation Factor:** The percentage of annual consumption that the charge period is estimated to consume
- **Number of Days in Charge Period:** The number of days between the last charge period end date to the current charge period end date.
- **Added Usage:** Base energy usage not affected by temperature and is provided by the client

VALIDATE METER READING

If the number of digits read is more than the number of dials on the meter, the meter reading is a miss-read meter reading. Reject the meter reading.

Meter readings are converted to energy usage using the following formula:

Net Reading Measurement = Current Meter Reading – Previous Meter Reading used for
billing

If Net Reading Measurement < 0 test for meter wrap around.

Meter Wrap-around Test

The Maximum Meter Capacity Range calculation for energy is based on the number of dials on the Meter Function and the Maximum Meter Capacity Factor. If the Meter Capacity Factor is set at 70% it means that the consumption for an average charge period should not exceed 70% of the capacity of the meter.

Max Registered Read for Meter =

$(10^{**}(\text{number of dials}) - 1)$ (i.e.,: 9999 for 4 dials or 99999 for 5 dials)

Adjusted Net Reading Measurement = Max Registered Read for Meter + Net Reading
Measurement

Max Meter Capacity Range =

$\text{Max Registered Read for Meter} * \text{Billing Multiplier} * \text{Max Meter Capacity Factor} / 30$
 $\text{days} * \text{Number of Days in Charge Period}$

Example:

Number of Dials = 4

Meter Capacity Factor = 70%

Billing Multiplier = 1

Number of Days in Charge Period = 31

Max Registered Read for Meter = $10^{**}4 - 1 = 9999$

Meter Capacity Range =

$(9999 * 1 * 0.7) / 30 * 31$

$= 9999 * 0.7 * 1 / 30 * 31$

$= 7233 \text{ kWh}$

If Adjusted Net Reading Measurement > Meter Capacity Range

The meter reading is a misread meter reading. Reject the meter reading.

If Adjusted Net Reading Measurement <= Meter Capacity Range

Set the Net Reading Measurement = Adjusted Net Reading Measurement

Proceed to calculate energy usage

CALCULATE ENERGY USAGE

Energy Usage = Net Reading Measurement * Conversion Factor (or Billing Multiplier)

Example 1:

Previous Meter Reading used for billing = 3290

Current Meter Reading = 3850

Billing Multiplier = 1

Net Reading Measurement = $3850 - 3290 = 560$

Energy Usage = $560 * 1 = 560$

Example 2:

Previous Meter Reading used for billing = 3290

Current Meter Reading = 3270

Billing Multiplier = 1

Max Registered Read for Meter = 9999

Meter Capacity Range = 6999

Net Reading Measurement = $3270 - 3290 = -20$

Net Reading Measurement < 0 perform meter wrap-around test

Adjusted Net Reading Measurement = $9999 + (-20) = 9979$

Adjusted Net Reading Measurement > 6999

The meter reading is a misread meter reading. Reject the meter reading.

Example 3:

Previous Meter Reading used for billing = 8890

Current Meter Reading = 10

Billing Multiplier = 1

Max Registered Read for Meter = 9999

Meter Capacity Range = 6999

Net Reading Measurement = $10 - 8890 = -8880$

Net Reading Measurement < 0 perform meter wrap-around test

Adjusted Net Reading Measurement = $9999 + (-8880) = 1119$

Adjusted Net Reading Measurement < 6999

Net Reading Measurement = 1119

Energy Usage = $1119 * 1 = 1119$ kWh

HI/LOW ENERGY USAGE VALIDATION

Estimated Usage Calculation

If the site usage is heat sensitive, the following components are used in the calculation of the estimating factor:

- Degree Days
- Base Load Percentage (currently set at 74% Gas and 77.2% Electric)
- Heat Load Percentage (currently set at 26% Gas and 22.8% Electric)

The Heat Sensitive Estimating Factor =

$((\text{Degree Days in Period} / \text{Degree Days for previous year}) * \text{Heat Load}) + ((\% \text{ of Base Load} / 365) * \text{Number of Days in Period})$

Estimated Charge Period Energy Usage =

$\text{Annual Consumption} * \text{Estimate Factor} / 30 \text{ days} * \text{Number of Days in Charge Period}$

Hi/Low Range Calculation

The HI/LO Range calculation for energy validation is based on Annual Consumption. Energy usage is validated against the HI/LO ranges. The values of the validation factors can vary by season. The following are the energy usage validation factors:

- High-1 Consumption Factor used for calculating High-1 Consumption Range
- High-2 Consumption Factor used for calculating High-2 Consumption Range
- Low-1 Consumption Factor used for calculating Low-1 Consumption Range
- Low-2 Consumption Factor used for calculating low-2 Consumption Range

For example:

High-1 factor of 2.0 means a warning will be produced if the usage received from the distributor is higher than two (2) times estimated usage (based on annual consumption) for the billing period.

High-1 Consumption Range =

$(\text{Estimated Charge Period Energy Usage} + \text{Added Usage}) * \text{High-1 Consumption Factor}$

High-1 Consumption Range is the lowest of the calculated **High-1 Consumption Range** and the **Annual Consumption**

High-2 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x High-2 Consumption Factor

High-2 Consumption Range is the lowest of the calculated **High-2 Consumption Range** and the **Annual Consumption**

Low-1 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x Low-1 Consumption Factor

Low-2 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x Low-2 Consumption Factor

VALIDATE ENERGY USAGE USING HI/LO RANGES

The energy usage is validated against the High-2 Consumption Range first. If validation fails the High-1 Consumption Range test will be skipped. Similarly, if usage fails Low-2 Consumption Range validation, the Low-1 Consumption Range test will be skipped.

- If energy usage > Energy High-2 Consumption Range - Fatal error condition
- If energy usage > Energy High-1 Consumption Range - Warning error condition
- If energy usage < Energy Low-2 Consumption Range - Warning error condition
- If energy usage < Energy Low-1 Consumption Range - Warning error condition
- If energy usage = 0 - Warning error condition

Examples of cause for **fatal** error include:

- Miss-read meter
- Abnormal usage for current period - out of acceptable range
- Non-register meter

If energy consumption fails high-2 it is considered “**fatal**” error. The system will **not** attempt to use the usage to calculate charges. A fatal work queue item will be created for investigation.

If the consumption fails high-1 or low-1 or low-2 it is considered “warning”. The system will use the usage to calculate charges but the account will be sent to the work queue for review.

Example:

Energy Usage for the Charge Period = 1190 kWh

Number of Days in the Charge Period = 31

Annual Consumption for the site = 8500 kWh

Estimate Factor = 8% of annual consumption

High-1 Consumption Factor = 200%

High-2 Consumption Factor = 400%

Low-1 Consumption Factor = 25%

Low-2 Consumption Factor = 10%

Added Usage = 25 kWh

Estimated Charge Period Energy Usage = $8500 * 0.08 / 30 * 31 = 703$ kWh
High-1 Consumption Range = $(703 + 25) * 200\% = 1456$ kWh
High-2 Consumption Range = $(703 + 25) * 400\% = 2912$ kWh
Low-1 Consumption Range = $(703 + 25) * 25\% = 182$ kWh
Low-2 Consumption Range = $(703 + 25) * 10\% = 73$ kWh
Energy Usage of 1190 kWh **passes** the energy usage validation because it is less than High-1 Consumption Range and High-2 Consumption Range and greater than Low-1 Consumption Range and Low-2 Consumption Range.

A2 ATCO Gas

A2.1 Estimation Methodology

ATCO-CIS ESTIMATING FACTORS

Heat Sensitive Estimate Factor

If the site usage is heat sensitive, the following components are used in the calculation of the estimating factor:

- Degree Days
- Base Load Percentage (currently set at 74%)
- Heat Load Percentage (currently set at 26%)

The calculation of the Heat Sensitive Estimating Factor for 30-day charge period is

$$((\text{Degree Days in Period} / \text{Degree Days for previous year}) * \text{Heat Load}) + ((\% \text{ Of Base Load} / 365) * \text{Number of Days in Period})$$

ATCO CIS calculates the estimate factor at cycle billing time. The estimate factor is based on 30-day billing period.

Non-Heat Sensitive Estimate Factor

If the site usage is non-heat sensitive, ATCO Gas determines the estimate factors. Each day the estimating factor is entered into ATCO-CIS to be used for cycle billing. The estimate factors are based on 30-day charge period.

ESTIMATED ENERGY CALCULATION

In ATCO-CIS, energy consumption is estimated when actual meter reading is not available for usage calculation. The estimated consumption is calculated as:

Estimating Factor = See formula above for heat sensitive and non-heat sensitive services

Raw Estimate (30 days) = Annual Consumption * Estimating Factor for Usage Period

Raw Estimate (actual days) = Raw Estimate (30 days)/30 * Number of Days in
Charge Period

Net Reading Conversion = Raw Estimate / Billing Constant

Estimated Consumption = Reading Conversion * Billing Constant

Example of Estimating Consumption

Days in Charge Period	29 days
Annual Consumption:	150 GJ
Estimating Factor	.171
Billing Constant	1.05462
Raw Estimate (30 days)	$150 * .171 = 25.65$ GJ
Raw Estimate (actual days)	$25.65 / 30 * 29 = 24.80$ GJ
Net Reading Estimate	$24.80 / 1.05462 = 23.51$
Estimated Consumption	$24 * 1.05462 = 25$ GJ

Annual Consumption

ATCO CIS has the capability to keep two sets of Annual consumption. One is the Manually Entered Annual Consumption and the other is the System Calculated Annual Consumption. Annual consumption is used in estimating usage when an actual meter reading is not available. Annual consumption data stays with the service site. Therefore, customers moving from one location to another will inherit the annual consumption of the new site.

Manually Entered Annual Consumption

Generally, Manually Entered Annual Consumption can be entered into ATCO CIS and override the System Calculated Annual Consumption for a period of time. During that time, ATCO CIS will use the Manually Entered Annual Consumption for usage estimation. At the same time, ATCO CIS will continue to update the System Calculated Annual Consumption. The following examples are situations when Manually Entered Annual Consumption is used:

- New site without enough history to calculate annual consumption
- The consumption pattern of the site changed and the current System Calculated Annual Consumption based on past history no longer represents the current usage pattern

In most case, the manually entered annual consumption will be in effect for 180 days and then the system will switch to using system calculated annual consumption.

System Calculated Annual Consumption

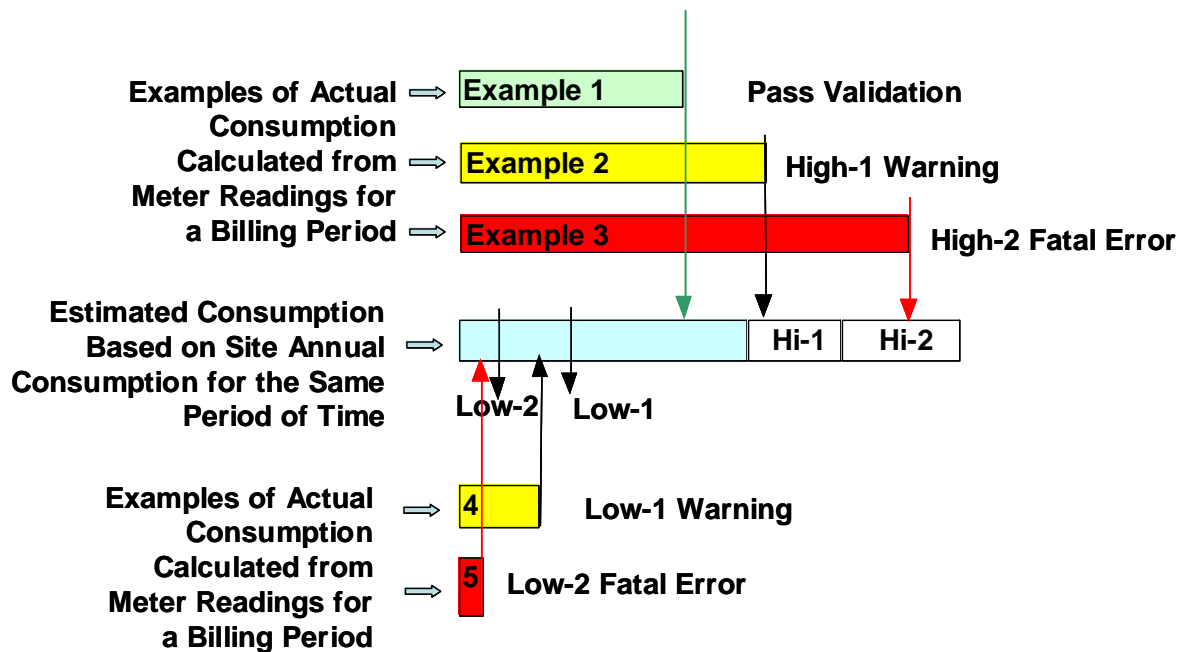
ATCO CIS updates the System Calculated Annual Consumption for a site whenever an actual usage is used for charge calculation. The System Calculated Annual Consumption is a rolling 12-month accumulated consumption for a site. ATCO CIS totals 12 months or up to 425 days of consumption or as much history available (if less than 12 months).

System Calculated Annual Consumption =
 (Total consumption accumulated/Total number of days usage is accumulated) *365

A2.2 Meter Read Validation Thresholds

ATCO's philosophy behind the energy consumption high-low verification is to compare the actual measured consumption to an estimated consumption for the same time period based on the site consumption history. If the actual consumption is outside of the tolerance ranges ATCO CIS will either generate a warning or fatal error for the meter reading. A warning means that the consumption requires review but will be used for billing. A fatal error means the consumption requires investigation and will **not** be used for billing.

Meter Read Validation in ATCO CIS



Here are some definitions of terms:

- **Annual Consumption:** The 365 days of system calculated energy consumption for a site based on actual usage received from MDM. Manual estimated annual consumption can be determined if there is not enough consumption history available for the site
- **Estimation Factor:** The percentage of annual consumption that the charge period is estimated to consume
- **Number of Days in Charge Period:** The number of days between the last charge period end date to the current charge period end date.
- **Added Usage:** Base energy usage not affected by temperature and is provided by the client

VALIDATE METER READING

If the number of digits read is more than the number of dials on the meter, the meter reading is a miss-read meter reading. Reject the meter reading.

Meter readings are converted to energy usage using the following formula:

Net Reading Measurement = Current Meter Reading – Previous Meter Reading used for
billing

If Net Reading Measurement < 0 test for meter wrap around.

Meter Wrap-around Test

The Maximum Meter Capacity Range calculation for energy is based on the number of dials on the Meter Function and the Maximum Meter Capacity Factor. If the Meter Capacity Factor is set at 70% it means that the consumption for an average charge period should not exceed 70% of the capacity of the meter.

Max Registered Read for Meter =

$(10^{**}(\text{number of dials}) - 1)$ (i.e.,: 9999 for 4 dials or 99999 for 5 dials)

Adjusted Net Reading Measurement = Max Registered Read for Meter + Net Reading
Measurement

Max Meter Capacity Range =

$\text{Max Registered Read for Meter} * \text{Billing Multiplier} * \text{Max Meter Capacity Factor} / 30$
 $\text{days} * \text{Number of Days in Charge Period}$

Example:

Number of Dials = 3

Meter Capacity Factor = 70%

Installation Multiplier = 1

Number of Days in Charge Period = 31

Max Registered Read for Meter = $10^{**}3 - 1 = 999$

Meter Capacity Range =

$(999 * 1 * 0.7) / 30 * 31$

$= 999 * 0.7 * 1 / 30 * 31$

$= 723 \text{ mcf}$

If Adjusted Net Reading Measurement > Meter Capacity Range

The meter reading is a misread meter reading. Reject the meter reading.

If Adjusted Net Reading Measurement <= Meter Capacity Range

Set the Net Reading Measurement = Adjusted Net Reading Measurement

Proceed to calculate energy usage

CALCULATE ENERGY USAGE

Energy Usage = Net Reading Measurement * Conversion Factor (or Billing Multiplier)

ATCO Gas's Billing Multiplier converts gas volume measurement into energy usage.

Where:

GJ = Gigajoules
MJ = Megajoules
mcf = thousand cubic feet
m3 = cubic meter

Energy Usage (GJ) = Uncorrected Measured Gas Volume (mcf) * Billing Multiplier (GJ/mcf)

Billing Multiplier (GJ/mcf) = Installation Multiplier * Heat Value (GJ/mcf)

Heat Value is calculated in System Internal (SI) conversion, MJ/m³, and must be converted to GJ/mcf since Uncorrected Measured Gas Volume is in mcf.

Heat Value (GJ/mcf) = Heat Value (MJ/m³) * 0.0001 (GJ/MJ) * 28.174 m³/mcf

Installation Multiplier = Meter Multiplier * Pressure Correction Factor * Super-compressibility factor

Pressure Correction Factor = PF Factor * PFM Factor * Base Factor * Elevation Factor

PF Factor, PFM Factor, Base Factor and Elevation Factor are based on the metering pressure, atmospheric pressure, and elevation of the site where the meter is installed.

Example 1:

Previous Meter Reading used for billing = 380
Current Meter Reading = 385
Billing Multiplier = 1.09 GJ/mcf
Net Reading Measurement = 385-380 = 5 mcf
Energy Usage = 5 mcf * 1.09 GJ/mcf = 5.45 GJ

Example 2:

Previous Meter Reading used for billing = 329
Current Meter Reading = 327
Billing Multiplier = 1.09
Max Registered Read for Meter = 999
Meter Capacity Range @ 70% = 699
Net Reading Measurement = 327-329 = -2
Net Reading Measurement < 0 perform meter wrap-around test
Adjusted Net Reading Measurement = 999 + (-2) = 997
Adjusted Net Reading Measurement > 699
The meter reading is a misread meter reading. Reject the meter reading.

Example 3:

Previous Meter Reading used for billing = 899
Current Meter Reading = 10
Billing Multiplier = 1,09

Max Registered Read for Meter = 999
Meter Capacity Range = 699
Net Reading Measurement = 10-899 = -889
Net Reading Measurement < 0 perform meter wrap-around test
Adjusted Net Reading Measurement = 999 + (-889) = 110
Adjusted Net Reading Measurement < 699
Net Reading Measurement = 110
Energy Usage = 110 * 1.09 = 119.9 GJ

HI/LOW ENERGY USAGE VALIDATION

Estimated Usage Calculation

If the site usage is heat sensitive, the following components are used in the calculation of the estimating factor:

- Degree Days
- Base Load Percentage (currently set at 74%)
- Heat Load Percentage (currently set at 26%)

The Heat Sensitive Estimating Factor =
((Degree Days in Period / Degree Days for previous year) * Heat Load)) + ((% of
Base Load / 365) * Number of Days in Period))

Estimated Charge Period Energy Usage =
Annual Consumption * Estimate Factor/ 30 days * Number of Days in Charge Period

Hi/Low Range Calculation

The HI/LO Range calculation for energy validation is based on Annual Consumption. Energy usage is validated against the HI/LO ranges. The values of the validation factors can vary by season. The following are the energy usage validation factors:

- High-1 Consumption Factor used for calculating High-1 Consumption Range
- High-2 Consumption Factor used for calculating High-2 Consumption Range
- Low-1 Consumption Factor used for calculating Low-1 Consumption Range
- Low-2 Consumption Factor used for calculating low-2 Consumption Range

For example:

High-1 factor of 2.0 means a warning will be produced if the usage received from the distributor is higher than two (2) times estimated usage (based on annual consumption) for the billing period.

High-1 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x High-1 Consumption Factor

High-1 Consumption Range is the lowest of the calculated **High-1 Consumption Range** and the **Annual Consumption**

High-2 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x High-2 Consumption Factor

High-2 Consumption Range is the lowest of the calculated **High-2 Consumption Range** and the **Annual Consumption**

Low-1 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x Low-1 Consumption Factor

Low-2 Consumption Range =
(Estimated Charge Period Energy Usage + Added Usage) x Low-2 Consumption Factor

VALIDATE ENERGY USAGE USING HI/LO RANGES

The energy usage is validated against the High-2 Consumption Range first. If validation fails the High-1 Consumption Range test will be skipped. Similarly, if usage fails Low-2 Consumption Range validation, the Low-1 Consumption Range test will be skipped.

- If energy usage > Energy High-2 Consumption Range - Fatal error condition
- If energy usage > Energy High-1 Consumption Range - Warning error condition
- If energy usage < Energy Low-2 Consumption Range - Warning error condition
- If energy usage < Energy Low-1 Consumption Range - Warning error condition
- If energy usage = 0 - Warning error condition

Examples of cause for **fatal** error include:

- Miss-read meter
- Abnormal usage for current period - out of acceptable range
- Non-register meter

If energy consumption fails high-2 it is considered “**fatal**” error. The system will **not** attempt to use the usage to calculate charges. A fatal work queue item will be created for investigation.

If the consumption fails high-1 or low-1 or low-2 it is considered “warning”. The system will use the usage to calculate charges but the account will be sent to the work queue for review.

Example:

Energy Usage for the Charge Period = 119.9 GJ

Number of Days in the Charge Period = 31

Annual Consumption for the site = 850 GJ

Estimate Factor = 8% of annual consumption

High-1 Consumption Factor = 200%

High-2 Consumption Factor = 400%

Low-1 Consumption Factor = 25%

Low-2 Consumption Factor = 10%

Added Usage = 5 GJ

Estimated Charge Period Energy Usage = $850 * 0.08 / 30 * 31 = 70$ GJ

High-1 Consumption Range = $(70+5) * 200\% = 150$ GJ

High-2 Consumption Range = $(70+5) * 400\% = 300$ GJ

Low-1 Consumption Range = $(70+5) * 25\% = 18.75$ GJ

Low-2 Consumption Range = $(70+5) * 10\% = 8$ GJ

Energy Usage of 119.9 GJ **passes** the energy usage validation because it is less than High-1 Consumption Range and High-2 Consumption Range and greater than Low-1 Consumption Range and Low-2 Consumption Range.

A3 ENMAX Power

A3.1 Estimation Methodology

A3.1.1 Cumulative Meter Estimation

a) Broken Meter

1. Calculate the Average Daily Usage (ADU):
 - a) Calculate the ADUs from the previous 12 months’ reads if available. If not use step b.
 - b) Calculate the ADUs from the most recent 3 months’ reads, if available. If not, use step c
 - c) Calculate the ADUs from 2 or 1 periods, whichever is available
 - d) Calculate 80% of the average ADU
2. Calculate the number of days of use:
 - a) Investigate the date as to when the meter was removed.
 - b) Calculate the number of days from the last actual read date to the removal date.
3. Multiply the number of days of use by the estimated ADUs. This value determines the estimated consumption.
4. Divide the value in Step 3 by the (meter + billing multiplier) and add the value to the previous dial read to calculate the estimated dial read.

Example:

Read Date/Time	Days Diff	ADU	Read Type Code	Dial Read KWH	Consumption	Multiplier
2004-07-19 05:00:00	34.84	43.63	FINAL	395	1520	80
2004-06-15 08:50:47	33.00	48.48	ACTUAL	376	1600	80
2004-05-14 08:45:17	29.97	50.72	ACTUAL	356	1520	80
2004-04-15 09:34:37	31.91	47.63	ACTUAL	337	1520	80
2004-03-15 11:43:04	32.06	69.87	ACTUAL	318	2240	80
2004-02-13 10:18:27	29.01	68.95	ACTUAL	290	2000	80
2004-01-16 10:10:45	36.01	66.65	ACTUAL	265	2400	80
2003-12-12 09:54:48	25.00	57.60	ACTUAL	235	1440	80
2003-11-18 09:53:59	29.02	63.39	ACTUAL	217	1840	80
2003-10-21 09:18:08	34.01	51.75	ACTUAL	194	1760	80
2003-09-18 09:02:19	29.01	41.36	ACTUAL	172	1200	80
2003-08-21 08:46:21	35.03	47.96	ACTUAL	157	1680	80
2003-07-18 08:06:58	30.91	44.00	ACTUAL	136	1360	80

Average ADU = $54.8645034554.8645 \times 80\% = 43.89$

43.89×34 days (June 15 to July 19) = 1492 kWh

$1492 / 80$ multiplier + 376 last dial read on June 15 = 395 kWh July 19/2004 estimated final reading

b) Billing Estimation

Historical Meter Reads Exist:

Estimating Factor = 60%

Number of Days in Prior Consumption Period = Meter Read End Date – Meter Read Start Date

Number of Days in Estimation Period = Estimation Read End Date – Estimation Read Start Date

Average Daily Usage = (Total consumption accumulated/ Number of Days in Consumption Period)

Estimated Consumption = Average Daily Usage * Number of Days in Estimation Period

-
1. Calculate the consumption periods.
 - a) Calculate the total number of days in the estimated consumption period.
 - b) Calculate the total number of days in the prior consumption period.
 2. Calculate the minimum requirement for the representation of the estimated consumption period. This is determined as the number of days in the estimated consumption period multiplied by the estimating factor.
 3. If the previous period satisfies the minimum requirement for representation of the estimated consumption period, then the Average Daily Usage is total consumption in the previous period divided by the number of days in the previous period. If the minimum requirement is not satisfied, then the next prior consumption periods are taken until the minimum requirement is achieved. The total Average Daily Usage is the summation of total consumption accumulated divided by the number of days from the latest consumption period's end date and the earliest consumption period's start date of all prior consumption periods needed to satisfy the minimum requirement for representation of the estimated consumption period.
 4. The Average Daily Usage is multiplied to the number of days in the estimated consumption period to derive at the estimated consumption.

Historical meter reads do not exist:

Site is estimated at a seed value based on rate codes. These seed values will be disclosed on the EPC website.

c) Demand estimation – broken meters

Demand is currently estimated at 80% of the demand over the previous 12 months.

d) Demand estimation – billing

We are assessing whether we will estimate demand at 0 or in a similar fashion to our broken meter estimation (recognizing that a change may have to be made to the usage validation to allow estimated 0 demand not to be validated against kWh)

A3.1.2 Interval Meter Estimation

For estimating Interval meter data ENMAX Power follows the rules set out in the SSC (Rule 013)

A3.2 Meter Read Validation Thresholds

A3.2.1 Cumulative MDM

a) Handheld Validation

ENMAX Power uses the ITRON G5 Handheld as the first line of meter read validation. When a meter is read by the Meter Reader the dial read is entered into the handheld and consumption is validated by the handheld software. The validation works as follows:

- MDM software provides the handheld with an estimated value called the Estimated Consumption (EC). The EC represents the approximate consumption value of the anticipated meter read. The EC is then used in a formula to identify reads that would be considered high or low. Reads that are considered high or low prompt the Meter Reader to re-examine the meter and re-enter reads.
- The EC is calculated by determining the site's last read period that was greater than five days in length. The consumption value for that period and the number of days in the current period is then determined. That consumption value is divided by the number of days to calculate Average Daily Use (ADU).
- The next step in the EC calculation is the determination of the number of days in the current read period. This is calculated by recording the number of days between the last read date and expected read date; set to the creation date of the download, ERI file, plus two days.
- If there is no period greater than five days to create the EC, then a Profile Average Daily Usage is used instead in the calculation. Load Research sites update the Average Daily Use values for residential, small commercial and medium commercial sites (large commercial sites are not calculated because they are all read using MV-90).
- If there is no period greater than five days and no Profile ADU, then the estimated consumption is set to one. This circumstance will force the meter reader to re-enter the meter number and read on the site.

ERI Estimated Consumption Calculation

$$D/(C-B) = ADU$$

$$(E-F)+2 = G$$

$$G*ADU = \text{ERI Estimated Consumption}$$

A = previous read period of site greater than five days. Not directly used in calculation

B = the start date of A

C = the end date of A

C-B = the number of days in A

D = consumption value of A

E = ERI file creation date

F = date of last meter read

G = total days for this period of which to base estimated consumption

2 = days added to total days used in calculation to reflect business process

ADU = average daily use

ERI Estimated Consumption = Value used in Meter Reader handheld to base validation rules on

Handheld Validation Rules

The ERI Estimated Consumption is implemented into the handheld validation system and calculated for every meter. ENMAX Power uses assorted Tolerance Parameters based on meter type, but they generally are 70% and 20%. The way the handheld validates with these tolerances is by taking the ERI EC (as calculated in the above formula) and multiplies it by 70% (.7) and then adds the resulting amount to the EC for the High 1 tolerance. The High 1 tolerance is then multiplied by 20% (.2), and the result is added to the High 1 value to create the High 2. This creates two High thresholds. The low thresholds are calculated by multiplying the ERI EC by 0.7 for the Low 1 tolerance and then by 0.2 to create the Low 2 tolerance.

Example:

The following example details how this works, and the results:

$$EC = 100$$

$$\text{High 1} = (100 * 0.7) + 100 = 170$$

$$\text{High 2} = (170 * 0.2) + 170 = 204$$

$$\text{Low 1} = 100 - (100 * 0.7) = 30$$

$$\text{Low 2} = 30 - (30 * 0.2) = 24$$

Consumption Chart

0 L2 **24** L1 **30** Good **100** Good **170** H1 **204** H2

Any reads that fall between 30-consumption and 170-consumption pass validation (no prompt to Meter Reader). Reads that are between 170 and 204 fail High 1 and the meter reader will be prompted to re-read the meter. Reads that are greater than 204 fail High 2 and the meter reader is prompted to enter the meter number and re-read the meter.

Conversely, if the consumption value is between 24 and 30 the read will fail Low 1 and the Meter Reader will have to re-read the meter. If the consumption value is less than 24 there will be a Low 2 failure and the meter reader will be prompted to re-read the meter.

b) Automated MDM Validation

ENMAX POWER has developed a system called **Validation & Editing (VE)**. VE tests every cumulative meter read before it is posted to the database. VE uses validation standards to develop expected ranges for each meter read.

VE has 4 meter read sources:

- The Electronic Read Output (**ERO**) file is a list of scheduled cycle reads taken by meter readers.
- **Online** reads are reads entered in **Everest** by various data entry personnel.
- **Recalc** reads are reads that have been posted to the database but are re-sent for the purpose of correcting a site's history.
- **MIM** reads are life cycle reads captured when a service order is closed.

VE has 2 possible outcomes:

- The read is **validated** and posted to the database,

- Or the read is **suspended** and it is sent to MDM Validation Team for analysis.

c) MDM Validation Team Validation

The MDM Validation Team acts as the final checkpoint. MDM validation team evaluates all reads suspended identified by VE and determine whether or not the read should be posted to the database.

If a read fails our system, a MDM rep will look at the read and determine whether the read is good or not. If the read is high, the MDM rep will see if the read is within the 3 times the ADU. If it is, the read is considered to be a good read.

If a read is 0 for three months, the MDM rep. would issue a Service Order to verify what is happening at the site.

Load factors should not exceed 1. If it does for two months in a row, the MDM rep would send a Service Order to the Meter Shop.

There are also patterns that an MDM rep would look for when a reading has been kicked out of the system. Such patterns include; vacancies, meter exchanges and seasonal services.

The following is a list of errors that an MDM Rep. may encounter in the day to day validation process.

Error Text Message	Parameters based on Previous ADU to Current ADU
Error #403010 – Zero consumption Active meter	
Error #404010 Consumption on De-energized site	
Error #409010 - Failed Low Limit KWh	Current ADU is < 20 % of historical ADU
Error #409020 - Failed High Limit KWh	Current ADU is > 300 % of historical ADU
Error #500010 – Load Factor not validated	Load Factor is > 1.0
Error #500020 - Load Factor variance exceeds parameter	Load Factor is +/- 20 % of historical Load Factor
Error #500030 - Failed Demand Low Limit	Current Demand Read is < 20 % of historical demand Read
Error #500040 - Failed Demand High Limit	Current Demand Read is > 300 % of historical demand Read

The MDM validation team is able to decide the read is reasonable and release it, or request a check read, wait for the next cycle read to determine if it is reasonable.

Example:
ERR403010 – Zero consumption Active meter

Read Date/Time	Read Type Code	Dial Read KWH	Consumption
2004-09-08 18:48:20	ACTUAL	66461	0
2004-08-05 08:56:51	ACTUAL	66461	0
2004-07-07 08:57:04	ACTUAL	66461	0
2004-06-04 08:55:32	ACTUAL	66461	9
2004-05-05 08:48:56	ACTUAL	66452	3

ERR404010 – Consumption on De-energized site

Read Date/Time	Read Type Code	Dial Read KWH	Consumption
2004-09-09 08:30:44	ACTUAL	15380	1
2004-09-07 05:00:00	OFFCYC	15379	331
2004-08-25 13:20:22	ACTUAL	15048	723

* site was de-energized, the current reading is assigned this error message.

ERR409010 – Failed Low Limit kWh

Read Date/Time	ADU	Read Type Code	Dial Read KWH
2004-09-09 08:37:41	0.00	OFFCYC	92874
2004-08-30 10:40:59	0.00	ACTUAL	92874
2004-08-23 05:00:00	1.49	OFFCYC	92874
2004-07-28 08:55:50	5.71	ACTUAL	92834
2004-06-28 08:57:18	5.18	ACTUAL	92657
2004-05-27 08:52:02	6.20	ACTUAL	92486
2004-04-28 09:06:48	7.84	ACTUAL	92300
2004-03-30 10:10:26	6.77	ACTUAL	92065
2004-02-26 11:20:39	8.75	ACTUAL	91835
2004-01-29 10:42:24	10.86	ACTUAL	91581
2003-12-30 11:54:15	7.80	ACTUAL	91245
2003-11-27 12:35:10	7.04	ACTUAL	90980
2003-10-03 00:00:00	6.60	ACTUAL	90582

* current reading is below 20% of historical ADU

ERR409020 – Failed High Limit kWh

Read Date/Time	ADU	Read Type Code	Dial Read KWH
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2004-09-09 11:38:53	0.18	OFFCYC	84387
2004-08-24 09:37:50	0.04	ACTUAL	84384
2004-07-29 06:14:54	0.05	ACTUAL	84383

* current reading is above 300% of historical ADU

ERR500010 – Load Factor not validated

Read Date/Time	ADU	Load Factor	Read Type Code	Dial Read KWH	Dial Read KVA	Consumption	Max Demand KVA
2004-09-03 09:33:00	605.58	1.05	ACTUAL	7105	0.4	18180	24
2004-08-05 09:03:14	626.01	0.81	ACTUAL	6802	0.54	18720	32.4
2004-07-07 11:21:53	604.72	0.78	ACTUAL	6490	0.54	21180	32.4
2004-06-03 10:46:29	558.96	0.75	ACTUAL	6137	0.52	16740	31.2

* Load factor is greater than 1.0 but is a valid reading

ERR500020 – Load Factor variance exceeds parameters

Read Date/Time	ADU	Load Factor	Read Type Code	Dial Read KWH	Dial Read KVA
2004-09-07 09:04:14	202.32	0.13	ACTUAL	5138	0.4
2004-07-06 07:42:23	402.40	0.25	ACTUAL	5057	0.42
2004-06-04 07:40:04	495.53	0.31	ACTUAL	4974	0.42
2004-05-05 07:43:57	428.84	0.27	ACTUAL	4878	0.42
2004-04-02 08:52:30	505.89	0.30	ACTUAL	4787	0.44
2004-03-03 08:59:26	479.88	0.28	ACTUAL	4689	0.44
2004-02-05 08:49:08	533.41	0.32	ACTUAL	4605	0.44
2004-01-07 08:55:28	397.76	0.25	ACTUAL	4505	0.42
2003-12-04 09:01:32	535.03	0.33	ACTUAL	4418	0.42
2003-11-06 08:50:30	506.33	0.30	ACTUAL	4321	0.44
2003-10-08 08:21:23	500.56	0.31	ACTUAL	4226	0.42

* current reading is in this case – 20% of the historical Load Factor

ERR500030 – Failed Demand Low Limit

Read Date/Time	Load Factor	Read Type Code	Dial Read KWH	Dial Read KVA	Max Demand KVA	Consumption	Max Demand KVA	Multiplier
2004-09-03 13:03:01	0.23	ACTUAL	317	0.28	0.28	48	0.28	1
2004-08-04 13:49:35	0.21	ACTUAL	269	0.28	0.28	43	0.28	1
2004-07-06 13:54:26	0.22	ACTUAL	226	0.28	0.28	52	0.28	1
2004-06-02 13:12:25	0.24	ACTUAL	174	0.28	0.28	49	0.28	1
2004-05-03 13:12:00	0.24	ACTUAL	125	0.28	0.28	52	0.28	1
2004-04-02 14:03:24	0.24	ACTUAL	73	0.3	0.3	53	0.3	1
2004-03-03 14:43:34	0.24	ACTUAL	20	0.28	0.28	16	0.28	1
2004-02-23 12:01:00		INIT	4	0	0	0	0	1
2004-02-23 12:00:00	0.22	FINAL	3717	0.32	6.4	680	6.4	20
2004-02-04 14:42:38	0.23	ACTUAL	3683	0.32	6.4	1060	6.4	20
2004-01-06 15:20:54	0.25	ACTUAL	3630	0.3	6	1240	6	20
2003-12-04 14:16:38	0.24	ACTUAL	3568	0.3	6	1020	6	20
2003-11-06 15:04:59	0.23	ACTUAL	3517	0.32	6.4	1080	6.4	20
2003-10-07 12:26:13	0.23	ACTUAL	3463	0.3	6	1000	6	20

* current demand reading is < 20% of the historical demand reading

ERR500040 – Failed Demand High Limit

Read Date/Time	ADU	Load Factor	Read Type Code	Dial Read KWH	Dial Read KVA
2004-09-08 19:02:33	105.33	0.09	ACTUAL	318	0.405
2004-08-05 11:25:35	92.89	0.27	ACTUAL	287	0.121

* current demand reading is > 300% of the historical demand reading

A3.2.2 Interval MDM

For Interval meter data ENMAX Power follows the rules set out in the SSC (Commission's Rule 013).

A3.2.3 Billing Validation

Billing validation is performed both as a prebilling process and a post-billing process. Input data to billing is validated mostly as a "safety net" prior to running billing, if problems are found they are resolved prior to the run if possible.

Post-billing, validates the billing results as dollars and overall charges. Problems that are found in this area will hold the sites from upcoming billing runs until the problem is resolved.

A4 EPCOR Distribution & Transmission Inc. (EPCOR)

A4.1 Estimation Methodology

EPCOR will have full alignment between Settlement and Tariff. EDI will use initial settlement data to establish the estimate of a period and will replace it when an actual becomes available.

Process:

a) Calculate Profile Values

The creation of the NSL profile to be used in the allocation calculation of each site on a segmented basis. The NSL is also used to calculate estimate factors that are used by the estimation process.

Validation:

- All meter read validation would be completed in MDM.
- All pod consumption validation would be completed in MDM

Calculation:

$NSL_h = \sum POD_h - \sum DIM_h - \sum DEEMED_h - \sum Known_Losses_h$ This task will be performed once a day prior to the profile approval and after the calculation of interval allocation

b) Approve NSL Shape

The NSLS shape will be approved by an operational group. The values will be sent to the users and they will use the POD and DIM values to validate the NSL value, when the shape is correct, the profile will be approved.

The NSL values must form a shape that is similar to shapes that have been recorded in the past. Also the shape must be inline with the POD consumption data.

Business Rules:

- NSL values must not be greater then the POD values
- NSL values should be within an historical high/low boundary that is set by an operational group

This task will be performed once a day prior to the allocation of correction cumulative reads and after the calculation of profile values.

c) **Allocate cumulative correction**

When a meter read is received that exactly overlaps a current actual meter read, a new meter read must be allocated in place of the old meter read. With this correction process, the allocation is moved into the allocation history data store where the main allocation table only contains current allocated data for the sites.

Validation:

- All meter read validation would be completed in MDM.
- Ensure the cancellation exactly overlap the current consumption record and allocation record.

Business Rule:

- Cancel meter read must exactly overlap the current cumulative consumption meter read

This unit task will be called once a day prior to the allocation of actual cumulative meter reads and after the approval of the NSL profile values

d) **Estimate factor calculation**

Based on the actual cumulative meter reads that are received into the system, an estimate factor is created so that energy can be allocated for sites that do not have a meter read.

Validation:

- All meter read validation would be completed in MDM.

Calculation:

$$Estimated_Usage = \frac{MR_{ab}}{\sum_a^b NSLS}$$

This task will be performed once a day prior to the allocation of cumulative meter reads and after the allocation of cumulative correction meter.

Notes:

- Estimated_Usage = Estimating_Factor
- MR: Meter Read (for period a-b)
- NSLS: Net System Load Shape

e) **Allocate cumulative estimate**

To satisfy the SSC's requirements of an Initial settlement, this process will use a last actual allocation percentage to be applied against the profile to provide an estimate for energized sites. De-energized sites will not be estimated (the effective consumption is zero). Once an actual meter read is received this will be considered this sites allocated energy for the time segments required.

Validation:

- All estimate factor validation is done when the meter read that builds the estimate factor is validated in the MDM system.

Calculation:

$$EstkWh_t = Estimate_Factor(NSL_t)$$

This unit task will be called once a day prior to the creation of settlement reports and after the allocation of cumulative meter reads.

f) **Tariff bill calculation**

When the Tariff Bill is calculated the daily estimates will be aggregated to form the required periods.

A4.2 Meter Read Validation Thresholds

As stated above the validation is performed when the meter read that builds the estimate factor is validated in the MDM system.

A4.2.1 Itron (Handheld) Validations

The first line of validation of meter reads exists at the point in the meter data collection process where the operator enters the meter read manually into the Itron handheld device. The validation values are calculated currently by UIS and in the future by the MDM software and then and then loaded into the handheld (via MV-RS) for each individual site. These intervals are in place to ensure that accurate manual reads are occurring. The validation is based on high low values as described below:

- 2 sets of High/Low values are calculated.
- The system uses takes the previous meter read value and then adds the average consumption for the site to obtain an estimate for what the meter dials should read.
- The intervals are then created by applying percentages to the average consumption value and adding/subtracting these values to the dial read estimate. The percentages are fixed values for different levels of consumption and will be provided below.
- The high/low intervals are then transferred to the handheld for each site on the specific route.
- As the reader enters meter readings into the handheld each reading is checked against the 2 intervals before they are stored.
- If the reading falls outside of high/low interval 1 the operator is required to visually confirm the reading of the meter with that he/she entered into the system. If the reading is confirmed then the data is stored otherwise the operator may correct the entry if an error was made.
- If the reading falls outside of high/low interval 2 the operator is required to re-key the meter reading to ensure that it was entered correctly. This re-entered data is then stored in the system.
- Upon return to the meter office these reads are then uploaded to the system.

The calculations for these intervals are described below:

30 day average = estimate from Site Allocation

average consumption = (30 day average * (# of days in period / 30)) / multiplier

dial read estimate = previous dial read + average consumption

H1 = dial read estimate + (average consumption * H1%)

H2 = dial read estimate + (average consumption * H2%)

L1 = dial read estimate – (average consumption * L1%)

L2 = dial read estimate – (average consumption * L2%)

There are 3 sets of rate codes to which different high/low intervals are applied and these are described in the table below:

		Itron Reading Intervals											
		Residential Ranges				Small Commercial Ranges				Medium Commercial Ranges			
Consumption Range		Interval 1		Interval 2		Interval 1		Interval 2		Interval 1		Interval 2	
From	To	Low %	High %	Low %	High %	Low %	High %	Low %	High %	Low %	High %	Low %	High %
0.00	900.99	20%	300%	10%	350%	11%	300%	10%	400%	20%	300%	10%	350%
901.00	1800.99	25%	200%	20%	250%	11%	300%	10%	400%	25%	200%	20%	250%
1801.00	3000.99	50%	150%	25%	200%	11%	300%	10%	350%	50%	150%	25%	200%
3001.00	6200.99	55%	145%	30%	195%	11%	300%	10%	350%	55%	145%	30%	195%
6201.00	10000.99	60%	140%	35%	190%	11%	101%	10%	200%	60%	140%	35%	190%
10001.00	50000.99	65%	135%	40%	185%	11%	101%	10%	150%	65%	135%	40%	185%
50001.00	99999999.0	70%	130%	45%	180%	11%	101%	10%	150%	70%	130%	45%	180%

A4.2.2 System level validations

The current system level validation process consists of three sets of validation rules that each consumption value that results from a cumulative meter read must pass. Any values that fail one or more of these validation rules is rejected and results in the generation of an edit report. These edit reports are then manually verified by operators who verify using a variety of different methods including historical examination, water use comparisons, sending for another read and a variety of other options. The three validation rules are summarized below:

A4.2.2.1 Consumption High & Low Percentage Values

The consumption high and low percentage values are applied to all cumulative meter consumption measures to create high and low levels that all consumption figures must pass to be validated. The high and low values are calculated as follows:

- The previous periods pro rated monthly consumption (based on 30 days) is used as the baseline
- High and low percentages are collected from the table based upon the previous periods pro rated monthly consumption
- The high and low percentages are then multiplied with the baseline to create a high low range
- The current periods pro rated monthly consumption is compared against the high low values and if it falls outside of the range and edit report is created

Mathematically the process is:

*High: Last Period Pro-Rated (30 day) Consumption*High(%)*

*Low: Last Period Pro-Rated (30 day) Consumption*Low(%)*

The high and low percentages sorted by rated code and consumption levels are provided below:

		System Consumption Intervals (IN USE)					
		Residential		Small Commercial		Medium Commercial	
Consumption Range		Interval 2		Interval 2		Interval 2	
From	To	Low %	High %	Low %	High %	Low %	High %
0.00	900.99	10%	350%	10%	400%	10%	350%
901.00	1800.99	20%	250%	10%	400%	20%	250%
1801.00	3000.99	25%	200%	10%	350%	25%	200%
3001.00	6200.99	30%	195%	10%	350%	30%	195%
6201.00	10000.99	35%	190%	10%	200%	35%	190%
10001.00	50000.99	40%	185%	10%	150%	40%	185%
50001.00	99999999.0	45%	180%	10%	150%	45%	180%

A4.2.2.2 Max Demand High & Low Percentage Values

Only some sites on cumulative metering are equipped with a demand meter in addition to the conventional consumption meter. These meters record the maximum demand for the period and are reset at every read to then record maximum demand until the next meter read. For those sites that record demand values maximum demand high and low percentages are applied to validate the readings.

The high and low values are calculated as follows:

- The previous periods maximum demand is used as the baseline
- The previous power demand variance is applied as a percentage to this value in both directions to create high and low values
- The new demand reading is compared with the high and low values and if it falls outside of the range and edit report is created

Mathematically the process is:

High Value = Previous Period Max Demand(1+Previous Power Demand Variance)*

Low Value = Previous Period Max Demand(1-Previous Power Demand Variance)*

The previous power demand variance values currently used are sorted by rate code in the table below:

	Demand Variance
Residential	1%
Small Commercial	20%
Medium Commercial	20%

The current system uses the demand variance value for calculating in both directions, however this may be incorrect and the new system will examine the possibility of splitting the variance into a high and low percentage similar to the method employed in Section A3.2.1.

A4.2.2.3 Consumption High & Low Fixed Values

The consumption high and low fixed values represent maximum and minimum levels of monthly consumption (based on 30 days) that each site must pass. Any consumption values that fall outside of these ranges are rejected and result in an edit report of the reading. There high low fixed ranges for each of the three cumulative meter rate codes and these values are summarized in the table below:

	System High & Low Values			
	Warning Limits		Reject Limits	
	Low	High	Low	High
Rate Code				
Residential	2	1500	1	1750
Small Commercial	20	30000	10	75000
Medium Commercial	20	100000	10	15000 0

One also notes that there are two categories for the high and low fixed values one being a warning level and the second being the reject levels. However, consumption values that fall outside of the warning limits result in the generation of an edit report therefore making the reject limits useless.

A5 FortisAlberta

A5.1 Estimation Methodology

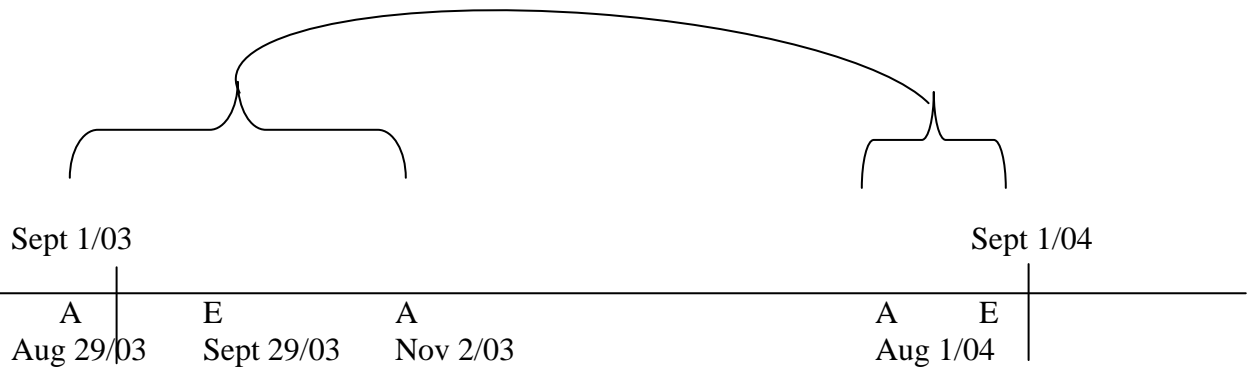
SAP Estimation Algorithm

There are 3 potential determinants used for the estimation calculation:

1) If FortisAlberta's Billing Engine has at least one actual read earlier than 365 days before the estimation date, the system calculates average daily usage (ADU) of the period between the closest actual read prior to that date and the closest actual read following that date. This ADU is then used to calculate the estimated usage in the current period based on the required number of days for the estimate.

2) If FortisAlberta's Billing Engine does not have sufficient history for the calculation in 1), but has at least two previous actual reads, the system calculates ADU based on the consumption between the last two actual reads closest to the estimate date.

3) If FortisAlberta's Billing Engine does not have at least two previous actual reads, the system calculates ADU based on seed values set by rate class.



Average Daily usage (ADU) calculated between August 29, 2003, and November 2, 2003, actual reads.

ADU applied to August 1, read to calculate the September 1, 2004, estimate.

Sample Consumption Calculation - Prior Year

- a) calculate days between last two actuals in the previous year
- b) calculate difference in readings for consumption
- c) divide consumption by number of days to find ADU
- d) find numbers of days between last reading and current estimate date
- e) apply ADU to number of days from last reading to determine consumption
- f) adds consumption determined to last reading to determine correct dial reading

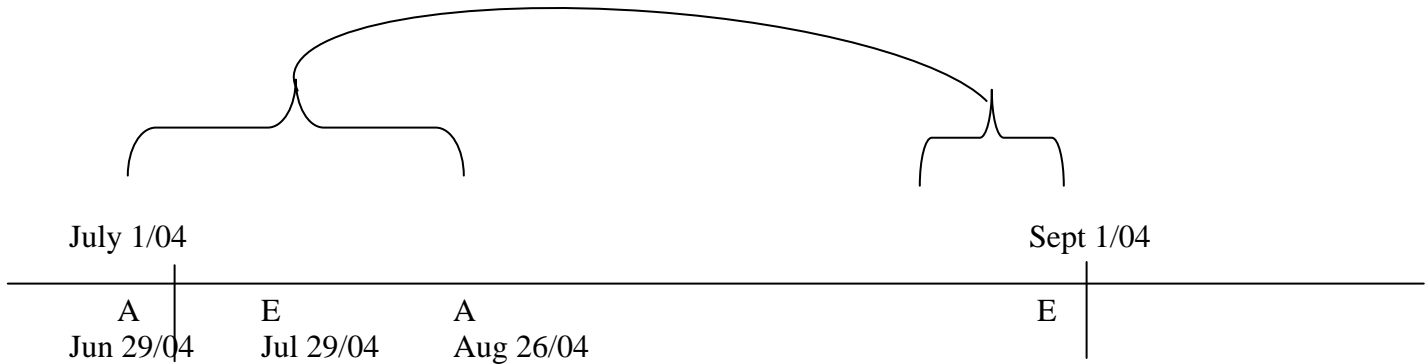
Read	Date	Dial
Current Estimate	09/01/04	?
Last read	08/01/04	34,654
Last read prior year after date required (actual)	11/02/03	29,788
Last read prior year before date required (actual)	08/29/03	29,168

- a) $11/02/03 - 08/29/03 = 65$ days
- b) $29788 - 29168 = 620$ kWh
- c) $620 / 65 = 9.5384$ ADU

-
- d) $09/01/04 - 08/01/04 = 31$ days
 - e) $9.5384 * 31 = 295.6904$ kWh
 - f) $34654 + 295.6923 = \mathbf{34,949}$

Note - FortisAlberta's Billing Engine does not perform any rounding on calculations until the last step.

Sample Consumption Calculation – Scenario 2 – Previous Period



- a) calculate days between last two actuals in the current year
- b) calculate difference in readings for consumption
- c) divide consumption by number of days to find ADU
- d) find numbers of days between last reading and current estimate date
- e) apply ADU to number of days from last reading to determine consumption
- f) adds consumption determined to last reading to determine correct dial reading

Read	Date	Dial
Current Estimate	09/01/04	?
Last actual read	08/26/04	34,654
Last actual read	07/29/04	29,788

- a) $08/26/04 - 07/29/04 = 28$ days
- b) $34654 - 29788 = 4866$ kWh
- c) $4866 / 28 = 173.7857$ ADU
- d) $09/01/04 - 08/26/04 = 6$ days
- e) $173.7857 * 6 = 1042.7142$ kWh
- f) $34654 + 1042.7142 = \mathbf{35,697}$

Sample Consumption Calculation – Scenario 3 – Seed Value by Rate



Rate Category	Period Consumption	Days
11	7,908 kWh	365
21,23,2411,2412,2421,2422,2441,2442	18,250 kWh	365
26	36,500 kWh	365
2901, 2902	85,166 kWh	365
41,43	24,333 kWh	365
45	60,833 kWh	365

Example Rate 11

Read	Date	Dial
Current Estimate	07/20/04	?
Last actual read	06/01/04	0

- calculate days between last read and current estimate required
- Divide period consumption by rate by 365 days for ADU
- Apply ADU to number of days from last reading to determine consumption
- adds consumption determined to last reading to determine correct dial reading

- $07/20/04 - 06/01/04 = 49$ days
- $7908 / 365 = 21.66575$
- $21.66575 * 49 = 1061.62$ kWh
- $0 + 1061.62 = \mathbf{1,062}$

A5.2 Meter Read Validation Thresholds

A5.2.1 Field Validations (ITRON)

The expected read is determined from FortisAlberta's Billing Engine is based on the estimation algorithm explained above. There are High 1 / High 2 and Low 1 / Low 2 warnings in ITRON.

High 1: 50% above expected
Low 1: 25% below expected

High 2: 100% above expected
Low 2: 50% below expected

The reader is warned if the read is above or below limits. The reader has to re-enter the reading.

E.g. If previous read was 1000 and expected new read was 3000 (based on previous year, month or seed) the limits would be:

H2: 5000 = $1000 + (2000 * 2)$
H1: 4000 = $1000 + (2000 * 1.5)$
L1: 2500 = $1000 + (2000 * .75)$
L2: 2000 = $1000 + (2000 * .5)$

A5.2.2 FortisAlberta's Billing Engine Validations

We currently have a multistep validation process post field (ITRON) validation:

- FortisAlberta's Billing Engine sets tolerances as H2 and L2 values calculated above and releases those reads that pass this validation step.
- Those sites that fail the H2 / L2 tolerances are then validated against expected rate class parameters and are released if they pass that validation step.
- The sites that fail either validations 1) or 2) are reviewed manually and released or corrected as required.

-
- d) Once billing is run for the site, dollar calculations are validated based on rate class expectations and are kicked out to an outsourcing report for manual review and correction as required.
 - e) If the site cannot bill because there are problems with the site setup, it is kicked out to a termination report for manual review and correction.

Reference C Description of Attributing Time to Meter Readings

In the absence of a standard market approach to attributing time to meter readings, the purpose Appendix C is to provide retailers in the Alberta electricity and natural gas markets with visibility into the approach and methodologies employed by each distributor in attributing time to meter readings in order to disclose usage and tariff charges at a whole day level in the tariff bill file.

C1 ATCO Electric

There are three **fundamental data rules** that apply to all meter data, as follows:

- Cumulative meter data is recorded as being read at a deemed time of 23:59:59 of the meter-read date.
- Interval meter data is recorded as being read in real time (i.e., actual date and time of read) .
- Dates within the tariff file indicate:
 - Start-date = exclusive (i.e., read at 23:59:59)
 - End-date = inclusive (i.e., read at 23:59:59)

C1.1 Approach to New Meter Installation

Examples of a new meter installation are:

- A cumulative meter is installed, read, and site energized at 2:00 PM on 1 March. The DCM and associated tariff file would indicate that the usage period started on 1 March. Note the rule above indicating the deemed time of read.

An interval meter is installed, and site energized at 2:00 PM on 1 April. The DIM would have a start time of 00:00:00 hours on 1 April and would show zeros until energy was consumed at 2:00 PM. The tariff file would show a start date according to the fundamental rules described above, i.e., 31 March.

C1.2 Approach to Meter Switches

Note the fundamental rules described above apply to this situation as well.

Example of Cumulative to Cumulative Meter Switch (note fundamental data rules above)

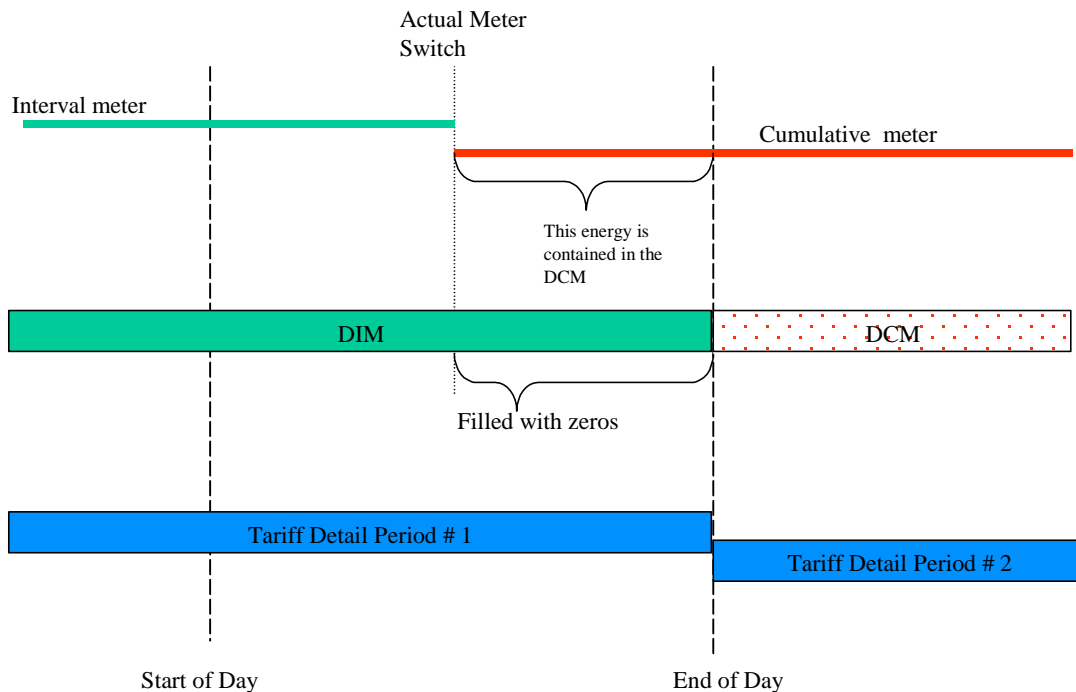
Meter is switched at 2:00 PM on 1 April. Old meter end read date = 31 March and new meter start read date = 1 April.

Example of Interval to Interval Meter Switch

Meter is switched at 2:00 PM on 1 May. Old meter end read date/time = 2:00 PM, 1 May and new meter start read date/time = 2:00 PM, 1 May.

Example of a Cumulative to Interval Meter Switch (Interval meter owns the switch day)

Example of an Interval to Cumulative Meter Switch (Interval meter owns the switch day)



C1.3 Approach to Energization/De-energization

Again note the fundamental rules described at the start of this section apply to these situations.

Example of an Energization of a site with a Cumulative Meter

The site is energized and meter read at 2:00 PM, 1 May. The DCM meter read start date = 1 May. The meter is deemed to be read at 23:59:59 therefore the energy is deemed to be used in the following day. The start date in the tariff file = 1 May.

Example of a De-energization of a site with a Cumulative Meter

The site is de-energized and meter read at 2:00 PM, 1 May. The DCM meter read end date = 1 May. The meter is deemed to be read at 23:59:59 therefore the energy is deemed to be used up to and including 1 May. The end date in the tariff file = 1 May.

Example of Energization of a site with an Interval Meter

The site is energized at 2:00 PM 1 May. The DIM would start at 00:00:00 hours on 1 May and be filled with zeros until energy was used at 2:00 PM. The tariff file would have a start date = 30 Apr.

Example of De-energization of a site with an Interval Meter

The site is de-energized at 2:00 PM, 1 May. The DIM would end at 23:59:59 hours on 1 May and be filled with zeros from 2:00 PM until the end of the day. The tariff file would have an end date = 1 May.

C1.4 Approach to Continuous Energization

Refer to the fundamental rules at the start of this section.

C2 ATCO Gas

There are 2 **fundamental data rules** that apply to all meter data which are as follows:

- Cumulative meter data is recorded as being read at a deemed time of 23:59:59 of the meter-read date.
- Dates within the tariff file indicate:
 - Start-date = exclusive (i.e., read at 23:59:59)
 - End-date = inclusive (i.e., read at 23:59:59)

C2.1 Approach to New Meter Installation

Examples of a new meter installation are:

- A cumulative meter is installed, read, and site energized at 2:00 PM on 1 March. The DCM and associated tariff file would indicate that the usage period started on 1 March. Note the rule above indicating the deemed time of read.

C2.2 Approach to Meter Switches

Note the fundamental rules described above apply to this situation as well.

Example of Cumulative to Cumulative Meter Switch (note fundamental data rules above)

Meter is switched at 2:00 PM on 1 April. Old meter end read date = 31 March and new meter start read date = 1 April.

C2.3 Approach to Energization/De-energization

Again note the fundamental rules described at the start of this section apply to these situations.

Example of an Energization of a site with a Cumulative Meter

The site is energized and meter read at 2:00 PM, 1 May. The DCM meter read start date = 1 May. The meter is deemed to be read at 23:59:59 therefore the energy is deemed to be used in the following day. The start date in the tariff file = 1 May.

Example of a De-energization of a site with a Cumulative Meter

The site is de-energized and meter read at 2:00 PM, 1 May. The DCM meter read end date = 1 May. The meter is deemed to be read at 23:59:59 therefore the energy is deemed to be used up to and including 1 May. The end date in the tariff file = 1 May.

C2.4 Approach to Continuous Energization

Refer to the fundamental rules at the start of this section.

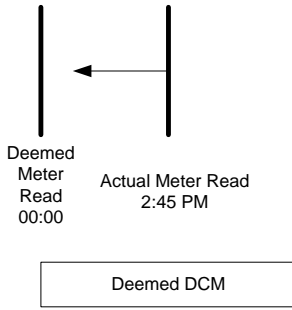
C3 ENMAX Power

Since the bill file does not accommodate hourly determinants, Enmax Power will be moving to a deemed time of midnight 00:00:00 on all of our meter reads.

C3.1 Approach to New Meter Installations

Cumulative Meters deemed to be midnight (start) of the day of the read

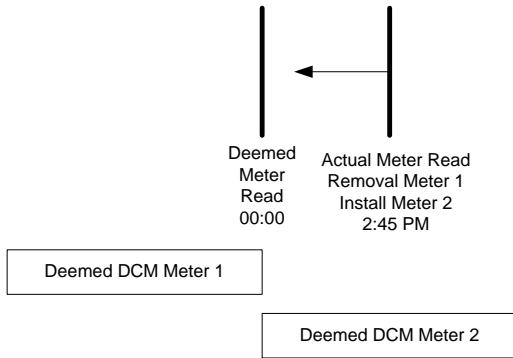
Interval Meters deemed to be midnight (start) of the day of the install



C3.2 Approach to Meter Switches

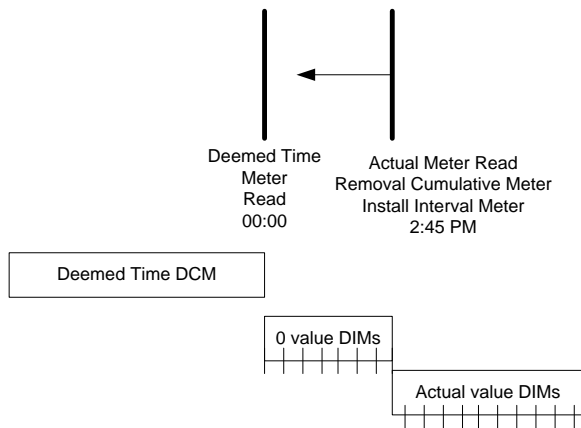
1) Cumulative to Cumulative Switch

All energy is pushed back to midnight of the day the read is actually taken



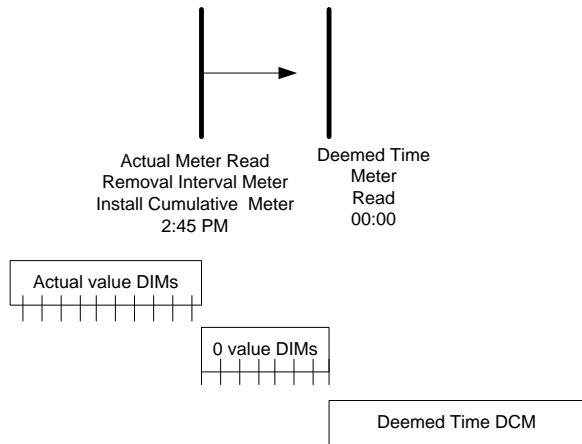
2) Cumulative to Interval Switch

- Cumulative deemed to midnight (start) of day of the read
- Interval 0 filled to the start of the day of the install and actual times used
- All energy used



3) Interval to Cumulative Switch

- should seldom occur
- would have to 0 fill interval to the end of the day
- deem the cumulative read to start at midnight of the NEXT day



- 4) Interval to Interval Switch
- actual data used, no loss of energy

C4 EPCOR

EPCOR supports the use of full days for all charges and consumption/demand values. EPCOR will deem all consumption forward to midnight as part of this support (For example, if a read is taken at 2:15 pm on June 14th, the resulting DCM will be deemed to 00:00:00, June 15th). It is EPCOR’s belief that this approach not only simplifies the Tariff Billing File, but it provides a more sensitive industry wide approach. Time stamps provide a level of confusion to Retailers and Customers.

C4.1 Approach to New Meter Installation

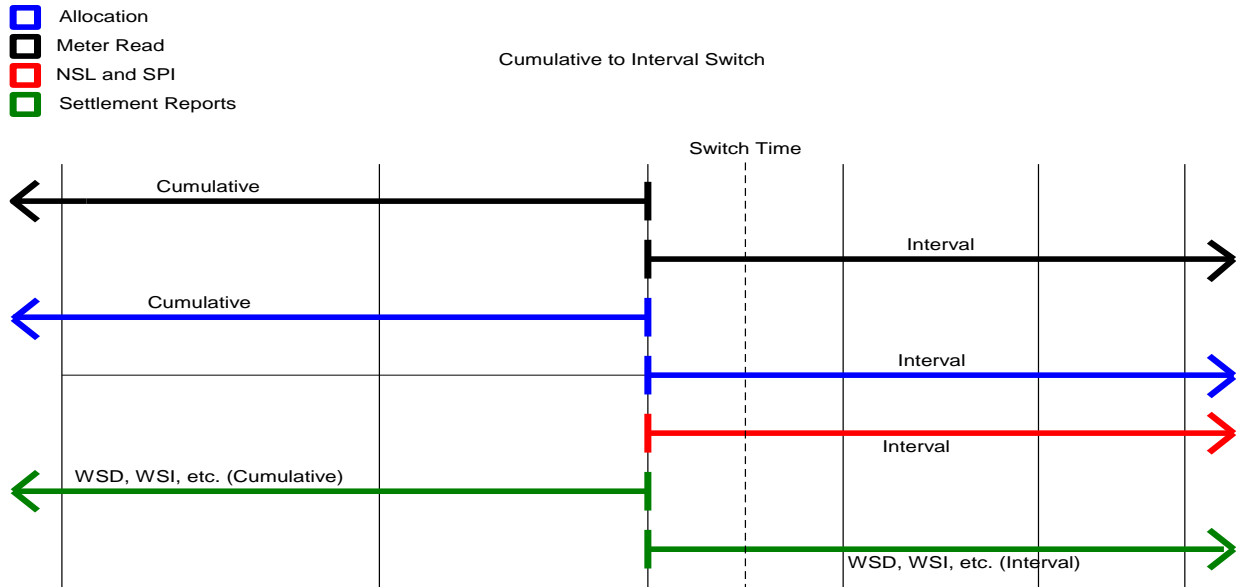
This situation follows the same approach as the meter switch. The only difference is in the Tariff Bill File. DCMs and DIMs would not be any different than section C1.2 below. In the case of the Tariff Bill File, a new service breaks a Tariff Bill Period (while a meter switch breaks only a usage period).

C4.2 Approach to Meter Switches

The following diagrams represent the suggested approach to meter switches (which are the situations, for which time stamps are intended to address)

1) Cumulative to Interval Switch

Diagram C-3 Cumulative to Interval Switch



- In this case consumption for the cumulative meter would be deemed back to midnight of the day (i.e. If the meter was removed on January 28th at 2:00pm, it would be deemed to end on January 28th at 00:00:00). This would account for all of the consumption . The only remaining risk is the pool price skew for those hours.
- The Interval meter would be deemed to midnight of the start of the day it was installed (i.e. If it was installed on January 28th at 2:00 pm, it would be deemed to start on January 28th at 00:00:00). For all intervals prior to the actual measurement of consumption, zeros would be inserted.
- DCM and DIMs would support the approach.
- The Tariff Bill File would have full days.
- The Usage Records in the Tariff Billing File would look as follows:

Tariff Billing File (Usage Section)

Determinants – Usage													
From Date	To Date	Site Status Code	Meter Type Code	Meter Number	Number of Dials	From Reading	From Reading Code	To Reading	To Reading Code	Billing Multiplier	Measured Consumption Amount	Measured Consumption UOM	Transaction Type Code
20040116	20040127	ACTV	C	A251254965	4	5200	A	5600	A	1	400.00	kWh	O
20040128	20040214	ACTV	I								600.00	kWh	O

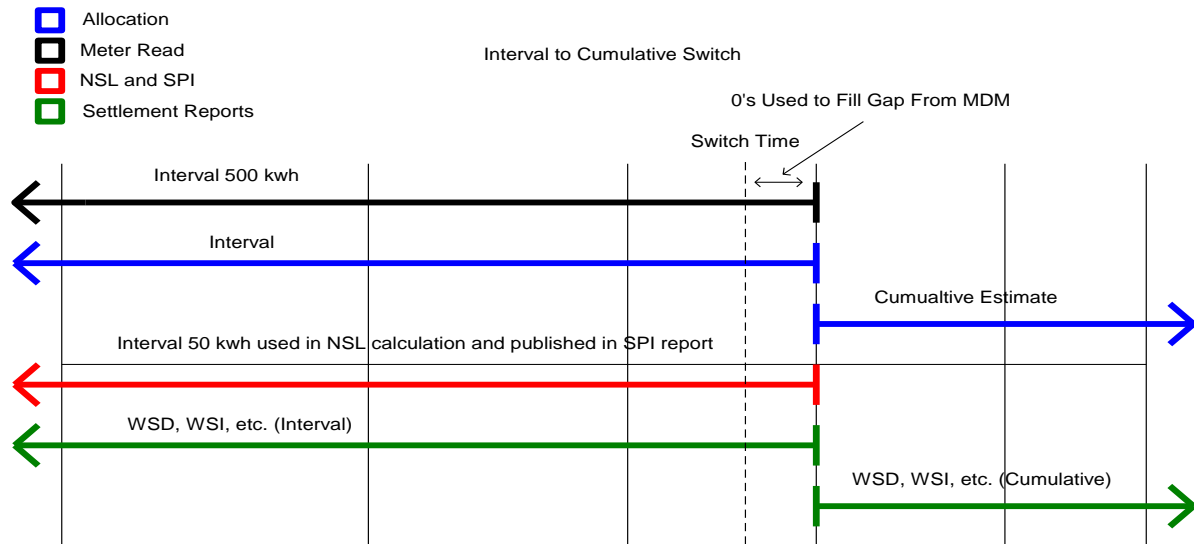
- The DCM and DIM would contain the following information:

DCM - Meter A251254965, 1000 kWh, 20031218000000 , 20040128000000, 4600, 5600

DIM - 20040128000000 = 0, ..., 20040128140000 = 0, 20040128141500 = 0.2, 20040128143000 = 0.1, ..., 20040128240000 = 0.0

2) Interval to Cumulative Switch

Diagram C-4 Interval to Cumulative Switch



- In this case consumption for the cumulative meter would be deemed at midnight of the following day (i.e. If the meter was installed at 2:00 pm on January 28th, it would be deemed to start at 00:00:00, January 29th). This would account for all of the consumption . The only remaining risk is the pool price skew for those hours.
- The Interval meter would be deemed to midnight of the end of the day it was removed (i.e. If the meter was removed at 2:00 pm on January 28th, it would be deemed to end at 00:00:00, January 29th). For all intervals following the actual measurement of consumption, zeros would be inserted.
- DCM and DIMs would support the approach.
- The Tariff Bill File would have full days.
- The Usage Records in the Tariff Billing File would look as follows:

Tariff Billing File (Usage Section)

Determinants – Usage														
From Date	To Date	Site Status Code	Meter Type Code	Meter Number	Number of Dials	From Reading	From Reading Code	To Reading	To Reading Code	Billing Multiplier	Measured Consumption Amount	Measured Consumption UOM	Transaction Type Code	
20040115	20040128	ACTV	I								300.00	kWh	O	
20040129	20040214	ACTV	C	A251254965	4	0000	A	0400	A	1	400.00	kWh	O	

-
- The DCM and DIM would contain the following information:

DIM - 20040128000000 = 0.1, ..., 20040128140000 = 0.2, 20040128141500 = 0,
20040128143000 = 0, ..., 20040129000000 = 0

DCM - Meter A251254965, 400 kWh, 20040129000000 , 20040214000000, 0, 400

3) Cumulative to Cumulative Switch

- Day belongs to the previous meter
- DCM will be deemed to reflect that

Tariff Billing File (Usage Section)

Determinants – Usage													
From Date	To Date	Site Status Code	Meter Type Code	Meter Number	Number of Dials	From Reading	From Reading Code	To Reading	To Reading Code	Billing Multiplier	Measured Consumption Amount	Measured Consumption UOM	Transaction Type Code
20040115	20040128	ACTV	C	A251254965	4	5200	A	5600	A	1	400.00	kWh	O
20040129	20040214	ACTV	C	A251256666	5	00000	A	00400	E	1	400.00	kWh	O

4) Interval to Interval Switch

- Not applicable as file would not contain:
 - Number of Dials for Interval Sites
 - Meter Number
 - Reading Numbers To and From
 - Billing Multiplier
- No SMC and change would be shown
- DIM would not show the change

Tariff Billing File (Usage Section)

Determinants – Usage													
From Date	To Date	Site Status Code	Meter Type Code	Meter Number	Number of Dials	From Reading	From Reading Code	To Reading	To Reading Code	Billing Multiplier	Measured Consumption Amount	Measured Consumption UOM	Transaction Type Code
20040115	20040214	ACTV	I								800.00	kWh	O

If the above methodology is implemented, the following modifications to the Tariff Billing Code would be required:

C4.3 Approach to Energization/De-energization

This situation follows the same approach as the meter switch. The only difference is in the Tariff Bill File. DCMs and DIMs would not be any different than section C1.2 below. In the case of the Tariff Bill File, a change of site status breaks a Tariff Bill Period (while a meter switch breaks only a usage period).

C4.4 Approach to Continuous Energization

EPCOR currently does not have this situation.

C5 FortisAlberta

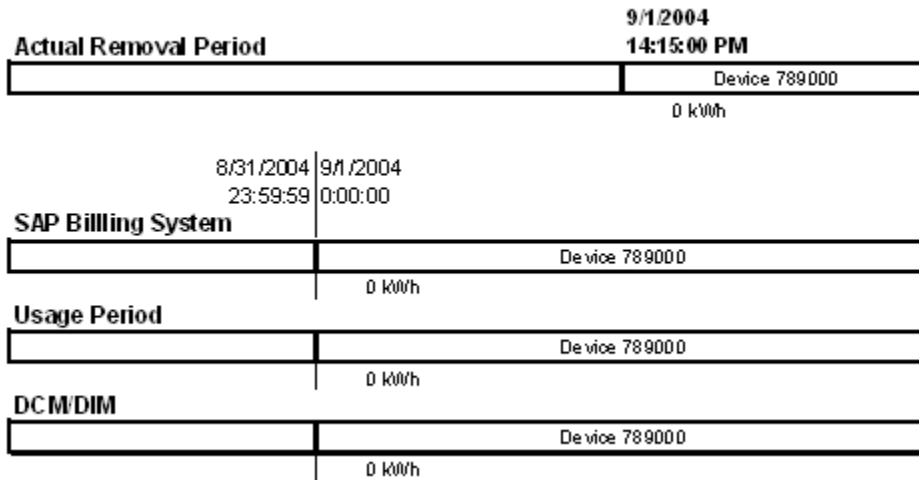
C5.1 Approach to New Meter Installation

For all cases of new meter installation, FortisAlberta deems the time to 00:00:00 of the day of installation.

Example – A meter is physically installed in the field at 14:15 in the afternoon on September 1, 2004. At the completion of the Dispatch order the meter is installed on the site in the FortisAlberta’s Billing Engine billing engine at a deemed time of 00:00:00 September 1, 2004.

The usage period for a new installation would be effective from the date of installation. The usage would be calculated for the entire day as FortisAlberta deems the time equal to a full day. A DCM for a new meter installation is also deemed to a time of 00:00:00 on the day of installation. The usage in a DCM would be attributed to the day of installation and would align with the tariff bill file usage.

New Meter Installation



C5.2 Approach to Meter Switch

FortisAlberta follows the same process for the following scenarios:

- Cumulative to Cumulative meter switch
- Cumulative to interval meter switch
- Interval to interval meter switch
- Interval to Cumulative meter switch

All meter removals conducted by FortisAlberta are deemed in the Billing Engine to the last second of the previous day. This allows FortisAlberta’s Billing Engine to align the meter installation with the deemed time of the 00:00:00 of the actual install day.

Example Scenario

Meter physically removed at site on September 1, 2004, at 14:00 p.m.
 FortisAlberta’s Billing Engine billing engine deems removal to 23:59:59 on August 31, 2004
 Replacement meter installed on site at 14:15 p.m. on September 1, 2004
 FortisAlberta’s Billing Engine billing engine deems installation to 00:00:00 on September 1, 2004

Meter Change

Actual Removal Period		9/1/2004 14:15:00 PM	
Device 123456	Device 789000		
45,789 kWh	0 kWh		
8/31/2004 23:59:59	9/1/2004 0:00:00		
SAP Billing System			
Device 123456	Device 789000		
45,789 kWh	0 kWh		
Usage Period			
Device 123456	Device 789000		
45,789 kWh	0 kWh		
DCM/DIM			
Device 123456	Device 789000		
45,789 kWh	0 kWh		

C5.3 Approach to Energization/De-energization

FortisAlberta deems all time for energizes and de-energizes in the Billing Engine. For a de-energize scenario the time is deemed to be equal to the last second, 23:59:59 of the day the de-energize is completed on.

For the various de-energize scenarios received by FortisAlberta the following 2 scenarios arise:

De-energize no meter removal with gap

Actual De-energize dates and time	9/1/2004 14:15:00 AM	9/1/2004 23:59:59	9/10/2004 11:00:00	9/10/2004 23:59:59	9/11/2004 0:00:00
	energize		de-energize		energize
	DER complete 1,800 kWh		ENR complete 1,800 kWh		
Tariff Period					
	energize		de-energize		energize
Usage Period					
	energize		de-energize		energize
DCM/DIM					
	energize		de-energize		energize

De-energize no meter removal no gap

Actual De-energize dates and time	9/1/2004 14:15:00 AM	9/1/2004 23:59:59	9/1/2004 11:00:00	9/1/2004 23:59:59	9/2/2004 0:00:00
	energize		de-energize		energize
	DER complete 1,800 kWh		ENR complete 1,800 kWh		
Tariff Period					
	energize		de-energize		energize
Usage Period					
	energize		de-energize		energize
DCM/DIM					
	energize		de-energize		energize

C5.4 Approach to Continuous Energization

FortisAlberta deems the time for all meter readings used in the billing engine. The following diagram outlines the allocation for a meter reading used for billing.

Continuous Energization

Actual Read Date and Time **9/1/2004**
14:15:00 PM

Device 123456	
	45,789 kWh

SAP Billing System 9/1/2004 9/2/2004
23:59:59 0:00:00

Device 123456	
	45,789 kWh

Usage Period

Device 123456	
	45,789 kWh

DCM/DIM

Device 123456	
---------------	--

Reference D Approach to Usage Estimate Corrections

In the absence of a standard market approach to usage estimate corrections, the purpose of Appendix D is to provide retailers in the Alberta electricity and natural gas markets with visibility into the position and approach employed by each distributor in correcting usage estimates and associated tariff charges following receipt of an actual meter read.

D1 ATCO Electric

ATCO Electric currently takes the following approach to cancel/rebill:

- If a prior period charge has to be cancelled and rebilled all subsequent billings since that prior period must also be cancelled and rebilled to ensure no gap between meter readings and consumption re-alignment
- There will never be partial charge period cancels
- Cancel/rebill can be triggered automatically or manually

Following receipt of an actual read, ATCO Electric may employ one of the following approaches:

1. **Full Cancel/rebill** - ATCO Electric does not perform unconditional cancel/rebill.
2. **Net Difference** – ATCO Electric uses the Net Difference method when:
 - **Prior period usage was estimated** - the actual meter reading received is **greater than** the last reading used for billing **and** the last reading used for billing is an estimated read. The actual usage between the previous actual read and the current actual read will “true-up” the estimated usage. The “true-up process” will provide the net difference to be used for the current period billing.
3. **Conditional Cancel/rebill** will occur when:
 - **Prior period usage was over estimated** - the actual meter reading received is **less than** the last reading used for billing **and** the last reading used for billing is an estimated read
 - **Prior period usage was over estimated** - the actual meter reading received is less than the last reading used for billing. If the last reading used for billing is an actual read manual investigation will occur to determine whether the prior or the current read is in error. Cancel/rebill will occur after the decision is made
 - **Two different readings for the same time period** - the actual meter reading received covers the **exact time period** as the last reading used for billing **and** the prior readings is different from the current meter reading

Example 1: Net Difference

- Account estimated usage in August
- Actual meter reading of 2752 obtained on September 10
- Sept 10 reading > August 7 estimated reading, therefore no cancel and re-bill
- The estimate usage will be “trued-up”
- The net difference of 370 kWh is used for Sep. 10 billing

Received Actual Reading of 2752 on September 10

Jun. 6	Jul. 5	Aug. 7	Sep. 10
Estimated Usage 527 kWh	Estimated Usage 655 kWh	Actual Usage 370 kWh	
Meter Reading (based on estimate) 1727	Meter Reading (based on estimate) 2382	Meter Reading 2752	

Example 2: Conditional Cancel/Re-bill

- Account estimated usage in August
- Actual meter reading obtained on September 10
- The meter reading is 2400 on September 10

Charge Periods

Jun. 6	Jul. 5	Aug. 7
Estimated Usage 527 kWh	Estimated Usage 755 kWh	
Meter Reading (based on estimate) 1727	Meter Reading (based on estimate) 2482	

- August 7 estimated reading of 2482 > Sept. 10 actual reading of 2400
- Triggered to cancel July 5 - August 7 billing
- 755 kWh usage is cancelled

Received Actual Reading of 2400 on September 10

Jun. 6	Jul. 5	Aug. 7
Estimated Usage 527 kWh	Estimated Usage 755 kWh	
Meter Reading (based on estimate) 1727	Meter Reading (based on estimate) 2482	

- System re-bill July 5 - August 7 billing
- System calculates usage of 673 kWh from Jul. 5 to Sept. 10
- System uses degree days formula to allocate usage for the Jul. 5 to Aug. 7 period
- The result is 360 kWh for July - Aug billing and 313 kWh for - Sept billing

Received Actual Reading of 2400 on September 10

Jun. 6	Jul. 5	Aug. 7	Sep. 10
Estimated Usage 527 kWh	Estimated Usage 360 kWh	Actual Usage 313 kWh	
Meter Reading (based on estimate) 1727	Meter Reading (based on estimate) 2087	Meter Reading 2400	

D2 ATCO Gas

ATCO Gas currently takes the following approach to cancel/rebill:

- If a prior period charge has to be cancelled and rebilled all subsequent billings since that prior period must also be cancelled and rebilled to ensure no gap between meter readings and consumption re-alignment
- There will never be partial charge period cancels
- Cancel/rebill can be triggered automatically or manually

Following receipt of an actual read, ATCO Gas may employ one of the following approaches:

4. **Full Cancel/rebill** - ATCO Gas does not perform unconditional cancel/rebill.
5. **Net Difference** –ATCO Gas uses the Net Difference method when:
 - **Prior period usage was estimated** - the actual meter reading received is **greater than** the last reading used for billing **and** the last reading used for billing is an estimated read. The actual usage between the previous actual read and the current actual read will “true-up” the estimated usage. The “true-up process” will provide the net difference to be used for the current period billing.
6. **Conditional Cancel/rebill** will occur when:
 - **Prior period usage was over estimated** - the actual meter reading received is **less than** the last reading used for billing **and** the last reading used for billing is an estimated read
 - **Prior period usage was over estimated** - the actual meter reading received is less than the last reading used for billing. If the last reading used for billing is an actual read manual investigation will occur to determine whether the prior or the current read is in error. Cancel/rebill will occur after the decision is made
 - **Two different readings for the same time period** - the actual meter reading received covers the **exact time period** as the last reading used for billing **and** the prior readings is different from the current meter reading

Example 1: Net Difference

- Account estimated usage in August
- Actual meter reading of 275 obtained on September 10
- Sept 10 reading > August 7 estimated reading, therefore no cancel and re-bill
- The estimate usage will be “trued-up”
- The net difference of 4.36 GJ is used for Sep. 10 billing

Received Actual Reading of 275 on September 10

Jun. 6	Jul. 5	Aug. 7	Sep. 10
Estimated Usage 2.97 GJ	Estimated Usage 3.27 GJ	Actual Usage 4.36 GJ	
Meter Reading (based on estimate) 268	Meter Reading (based on estimate) 271	Meter Reading 275	

Example 2: Conditional Cancel/Re-bill

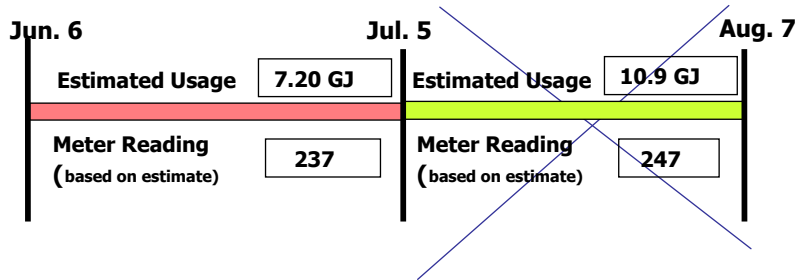
- Account estimated usage in August
- Actual meter reading obtained on September 10
- The meter reading is 245 on September 10

Charge Periods

Jun. 6	Jul. 5	Aug. 7
Estimated Usage 7.20 GJ	Estimated Usage 10.9 GJ	
Meter Reading (based on estimate) 237	Meter Reading (based on estimate) 247	

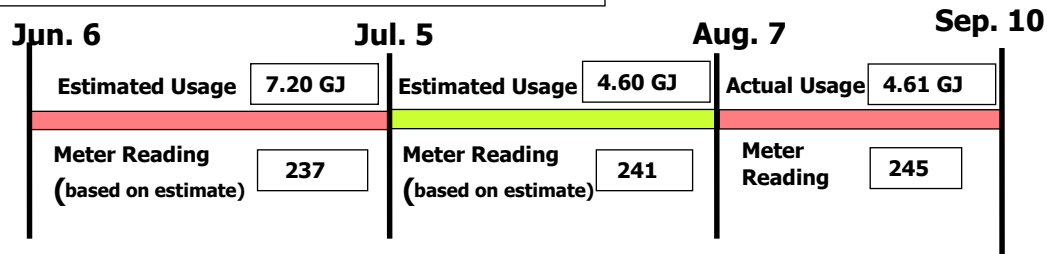
- August 7 estimated reading of 247 > Sept. 10 actual reading of 245
- Triggered to cancel July 5 - August 7 billing
- 10.9 GJ usage is cancelled

Received Actual Reading of 245 on September 10



- System re-bill July 5 - August 7 billing
- System calculates usage of 9.21 GJ from Jul. 5 to Sept. 10
- System uses degree days formula to allocate usage for the Jul. 5 to Aug. 7 period
- The result is 4.60 GJ for July - Aug billing and 4.61 GJ for Aug - Sept billing

Received Actual Reading of 245 on September 10



D3 ENMAX Power

Enmax Power will be performing a Cancel Rebill on all estimate to actual reads, even if there wasn't a kWh adjustment. Enmax Power will be applying a profile which matches the final settlement profile to any reads requiring allocation. This will ensure the consumption used in billing will exactly match what would have been done for a similar time period in Settlement to ensure that retailers are billed (from the Pool and for Tariff purposes) allocated energy on the same basis by which they bill the end customer.

D4 EPCOR

EPCOR's position is that **Full Cancel-Rebill** should be provided by billing period for all changes in past period charges. **EPCOR will follow such a model.** Materiality threshold tests or Distributor 'netting' will add complexity & delay, and will make reconciliation virtually impossible.

- Cancel-Rebill will occur at the Tariff Bill Period
- Each tariff bill adjusts for ALL prior periods that have changed with Cancel-Rebill
- Tariff Bill Periods are maintained for canceling and for rebilling.
- Tariff Bill Periods will have WSP unique ID
- Tariff period break must occur when a rate code or tariff unit price change occurs

D5 FortisAlberta

FortisAlberta applies the following approach to align estimates after the receipt of an actual.
Conditional Cancel/rebill - Overestimation workflow

When an actual read is entered into FortisAlberta’s Billing Engine that is lower than the previous estimate an overestimation work flow is triggered. The conditions to trigger the overestimation are as follows:

- Read received must be a periodic read (scheduled cycle read)
- The read must pass the normal validations parameters as outlined in appendix A1.2
- The actual read must be less than or equal to the last estimate(s)
- The actual read must be greater than the last actual read

Once the conditions are met the workflow is triggered to perform the following steps.

- a) reverse all applicable print documents
- b) create new estimates using the following methodology:
- c) calculate days between last actual reading for site and current actual
- d) calculate difference in readings for consumption
- e) divide consumption by number of days to find ADU
- f) find numbers of days between last actual and incorrect estimates
- g) apply ADU to number of days from last reading to determine correct consumption
- h) adds consumption determined to last actual to determine correct dial reading

Example

Read	Date	Dial
Current actual	09/14/04	34,697
Last estimate	08/17/04	34,712
Last Actual	07/15/04	34,417

Recalculation of estimate

- e) $9/14/04 - 7/15/04 = 61$ days
- f) $34697 - 34417 = 280$ kWh
- g) $280 / 61 = 4.590$ ADU
- h) $8/17/04 - 7/15/04 = 33$ days
- i) $4.590 * 33 = 151.4754$ kWh
- j) $34417 + 151.4754 = 34568$

Note - FortisAlberta’s Billing Engine does not perform any rounding on calculations until the last step.

Revised Estimates related to RRO flow through.

With the change to RRO pricing to include a staged percentage of flow through pricing in the RRO rate Fortis will cancel bills, revise estimates and rebill sites based upon tolerance thresholds determined in discussion with our RRO provider. Where an estimate average daily use (ADU) of a previously estimated bill period is outside of the tolerances set the site will be cancelled, re-estimated and rebilled i.e.

Jan 31 Actual	Reading	1000
Feb 28 Estimated	Reading	1100, average daily use = $(100 / 28 \text{ days}) = 3.57$
Mar 31 Actual	Reading	1900, average daily use from last actual = $(900/59) = 15.25$

Percentage difference = $15.25 / 3.57 = 427\%$. If allowable percentage for this rate code and actual ADU value was 40% this site would be cancelled, re-estimate and rebilled. The re-estimate would use a straight line estimation process.

Revised Feb 28 Estimate = Prev Read + ADU from actual X # days to estimate date
= $1000 + (15.25 * 28) = 1427$.

Cancel / rebill will occur for all retailers.

Reference E Pre-implementation Charge Presentation

In the absence of a standard market approach to presenting adjustments for pre-implementation charges, the purpose of Appendix E is to provide retailers in the Alberta electricity market with visibility into the position and approach employed by each distributor in presenting usage and tariff charge adjustments for usage and tariff charges incurred prior to the implementation of the Tariff Billing Code.

E1 ATCO Electric

Presentation of ATCO Electric's charges prior to Phase 3 implementation (as of May 30, 2008) will not fully conform to the requirements of the Tariff Billing Code. ATCO Electric's implementation of the TBC is met incrementally in 3 phases. Prior to completion of each phase, some validations will fail and some production rules may not be met.

Tables 1 and 2 provide processing detail and the associated validation rules that may not be met prior to implementation of the noted phases. General notes applicable to production rules or principles have also been included. Charges applicable to periods denoted in Tables 1 and 2 will be presented in accordance with production rules inherent to ATCO CIS processing standards that supported ATCO's EBL file at that time. Those items that will not be resolved due to long-term exemptions have also been noted.

Please note that since Phase 2 is the first phase at which a TBF is first published, only Phase 2 and 3 are covered.

Table 1 – Phase 2 (Processing Prior to July 1, 2006)

Item	Description	Presentation	Validation Failure
Table 3-1 (1)	Regular Billing Cycle	Cannot guarantee the length of the tariff bill period. ATCO CIS was designed for production of billing cycles ranging from 25 to 40 days.	General note.
Table 3-1 (5)	Customer Switch	An exemption has been granted. CSA processing ability will commence at Phase 3.	General note
Table 3-1 (9)	Change In Site Status	Tracking historic site status is a new practice for ATCO Electric and cannot guarantee presentation of a tariff period, usage period or charge period break when the site status is changed.	Disputes # 7008, 7009, 7010
Table 3-1 (10)	MDM Metering Output	Prior to ATCO Electric's Phase 3 Tariff Billing Code implementation, not all DCMs will result in a usage split.	Dispute # 7009
Table 3-1 (11)	Off Cycle Meter Reading	Not all off-cycle reads are used for billing prior to ATCO Electric's Phase 3 Tariff Billing Code implementation.	Dispute # 7009 – Misalignment of Usage Periods with Usage Period Events

Item	Description	Presentation	Validation Failure
Table 3-1 (13)	Distribution Tariff Price Change (Energy Based Charges)	A usage period break will not occur to support distribution tariff price changes for energy based charges. Usage periods are prorated into Charge Periods that are split by a rate change. Splitting of the usage periods will be available following ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6046 Dispute # 7009
Table 3-1 (15)	RRT Price Change	An exemption has been granted.	Long Term Exemption
Table 4-4 (8)	Tariff Bill Period Reference ID	This field will be null if a cancel goes back into a period prior to implementation.	Reject # 6005 and 6043
Table 4-4 (11)	Site Status Code	Tracking historic site status is a new practice for ATCO Electric and cannot guarantee the correct site status will be presented for a cancel or rebill of a pre-implementation billing period. This refers to a cancel where the rebill will pick up the current site status code and may not display the status of the original charge.	Reject #6044
Table 4-6 (9)	Usage Determinant Presentation	May not always have a DU record for a light that has been cancelled, depending on how far back you cancel. In January 2003, AE began to include energy in the DCM for lights. Note: Lights are very rarely cancelled.	Reject # 6003 or 6036
Table 4-6 (12)	Ratchet Date/Time	ATCO CIS does not store these attributes until ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 4-6 (13)	Ratchet Period Months	ATCO CIS does not store these attributes until ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 4-8 (17)	Component Unit Price	May be inaccurate or may not match any published rate. This can occur whenever a manual charge is created, in particular for complex rates where blending of component pricing was required in some cases. (Rate T31, D32)	General note
Table 4-8 (18)	Charge Amount	Manual calculations may not have all the components or may have inaccurate components. May not equal quantity x time x price. This can occur whenever a manual charge is created, in particular for complex rates. (Rate T31, D32)	Reject #6038 – Invalid calculated values.
Table 5.1 File Format Validation Failure	Dollar Contracts	Charges cancelled back to a period where a dollar KW contract was active will not have determinant to support the calculation. A zero Component Billed Quantity will be presented but will result in a Charge Amount.	Reject #6038
Table 4-9 (7)	One Time Charge Reference ID	This field will be null	Reject # 6043

Item	Description	Presentation	Validation Failure
	Billed Quantity Issue	May not be as expected for periods prior the elevation of the programs that change monthly to daily pricing. The change goes into effect November 17, 2005. Daily pricing. Daily Rates to be in effect January 1, 2006. For example, determinants (e.g. Demand Value) may be prorated into smaller periods or a ratio of billing days in the period may be presented to support fixed charges.	General Note
	Time Calculation Type Incorrect	The Time Calc Type will always be a P prior to the elevation of the programs that change monthly to daily pricing. The change went into effect November 17, 2005.	General Note
	Time Factor Incorrect	Time Factor will always be 1 prior to the elevation of the programs that change monthly to daily pricing. The change went into effect November 17, 2005 . This may result in proration of Component Billed Quantity.	General Note
	Incorrect Demand Type for Breakers	Will be coded as deemed (4070) until ATCO Electric's Phase 3 Tariff Billing Code Implementation. This is limited to Rates D51 and D56.	General note
	Demand Determinants Disclosure	An exemption has been granted. Full disclosure functionality will be available at approximately Phase 3.	General Note
4.3.1 and Table 4.5 (16)	Grouped Sites (Totalized and Subtract)	Effective January, 2006, AE does not have any grouped cumulative metered sites however pre-implementation charges prior to this date for grouped sites will be presented the same way as ATCO Gas where the DU record will disclose net consumption with a meter type of either T for totalized or S for subtract. See 4.3.1 (6),(7),(8) and Table 4.5 (16). AE will adhere to the Site Header, Usage Determinant and Demand Determinant production rules defined for gas commodity tariff billing of cumulative metered totalized and subtract metered sites.	General Note
	Cancelled Tariff Bill Period Charges for a De-energized Site with no Idle Charges	ATCO CIS does not publish an EBL for a Tariff Bill Period for a site that is de-energized and has no idle charges. If the charges are cancelled, the retailer will receive a cancelled tariff bill period for a tariff bill period that he never received.	General Note

Table 2 – Phase 3 (Processing Prior to May 30, 2008)

Item	Description	Presentation	Validation Failure
Table 3-1 (5)	Customer Switch	An exemption has been granted. CSA processing ability will commence at Phase 3.	General note
Table 3-1 (10)	MDM Metering Output	Prior to ATCO Electric's Phase 3 Tariff Billing Code implementation, not all DCMs will result in a usage split.	Dispute # 7009
Table 3-1 (11)	Off Cycle Meter Reading	Not all off-cycle reads are used for billing prior to ATCO Electric's Phase 3 Tariff Billing Code implementation.	Dispute # 7009
Table 3-1 (13)	Distribution Tariff Price Change (Energy Based Charges)	A usage period break will not occur to support distribution tariff price changes for energy based charges. Usage periods are prorated into Charge Periods that are split by a rate change. Splitting of the usage periods will be available following ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6046 Dispute # 7009
Table 3-1 (15)	RRT Price Change	An exemption has been granted	Long Term Exemption
Table 4-6 (12)	Ratchet Date/Time	ATCO CIS does not store these attributes until ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 4-6 (13)	Ratchet Period Months	ATCO CIS does not store this attributes until ATCO Electric's Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 5.1 File Format Validation Failure	Dollar Contracts	Charges cancelled back to a period where a dollar KW contract was active will not have determinant to support the calculation. A zero Component Billed Quantity will be presented but will result in a Charge Amount.	Reject #6038
	Incorrect Demand Type for Breakers	Will be coded as deemed (4070) until ATCO Electric's Phase 3 Tariff Billing Code implementation. This is limited to Rates D51 and D56.	General note
	Demand Determinants Disclosure	An exemption has been granted. Full disclosure functionality will be available at May 30, 2008. Until this time, demand determinant disclosure will be limited to 4000, 4080 or some other type of demand if billing demand is not based on metered demand.	General Note

Table 3 – Phase 3 (Processing After April 1, 2007)

Item	Description	Presentation	Validation Failure
DCM usage period	DCM usage period changes	Prior to April 1, 2007 DCM's for lights were created with a current reading date of ATCO's scheduled charge date. After April 1, 2007, ATCO will create DCM's for lights with a current reading date equal to the scheduled read date. When a cancel/rebill is required for a usage period generated prior to April 1, 2007, the cancel will reflect the original usage period (up to the charge date), The rebill will have two usage periods. The first would be from the original start date to the scheduled read date. The second usage period would be from the day following the scheduled read date to the original end date (i.e. charge date).	None

E2 ATCO Gas

Presentation of ATCO Gas' charges prior to Phase 3 implementation (as of May 30, 2008) will not fully conform to the requirements of the Tariff Billing Code. ATCO Gas' implementation of the TBC is met incrementally in three phases. Prior to completion of each phase, some validations will fail and some production rules may not be met.

Tables 1 and 2 provide processing detail and the associated validation rules that may not be met prior to implementation of the noted phases. General notes applicable to production rules or principles have also been included. Charges applicable to periods denoted in Tables 1 and 2 will be presented in accordance with production rules inherent to ATCO CIS processing standards that supported ATCO's EBL file at that time. Those items that will not be resolved due to long-term exemptions have also been noted.

Please note that since Phase 2 is the first phase at which a TBF is first published, only phases 2 and 3 are covered.

Table 1 – ATCO Gas Processing Prior to July 1, 2006

Item	Description	Presentation	Validation Failure
Table 3-1 (1)	Regular Billing Cycle	Cannot guarantee the length of the tariff bill period. ATCO CIS was designed for production of billing cycles ranging from 25 to 40 days.	General note.
Table 3-1 (5)	Customer Switch	An exemption has been granted. CSA processing ability will commence at Phase 3.	General note
Table 3-1 (9)	Change In Site Status	Tracking historic site status is a new practice for ATCO Gas and cannot guarantee presentation of a tariff period, usage period or charge period break when the site status is changed. A usage split is supported however tariff bill period splits were not supported. There will be no CH split.	Dispute # 7008 , 7009, 7010
Table 3-1 (10)	MDM Metering Output	Prior to ATCO Gas' Phase 3 Tariff Billing Code implementation, not all DCMs will result in a usage split.	Dispute # 7009
Table 3-1 (11)	Off Cycle Meter Reading	Not all off-cycle reads are used for billing prior to ATCO Gas's Phase 3 Tariff Billing Code implementation.	Dispute # 7009
Table 3-1 (13)	Distribution Tariff Price Change (Energy Based Charges)	A usage period break will not occur to support distribution tariff price changes for energy based charges. Usage periods are prorated into Charge Periods that are split by a rate change. Splitting of the usage and periods will be available following ATCO Gas' Phase 3 Tariff Billing Code implementation.	Reject # 6046 Dispute # 7009
Table 3-1 (15)	RRT Price Change	An exemption has been granted.	Long Term Exemption
Table 4-4 (8)	Tariff Bill Period Reference ID	This field will be null if a cancel goes back into a period prior to implementation.	Reject # 6005 and 6043
Table 4-4 (11)	Site Status Code	Tracking historic site status is a new practice for ATCO Gas and cannot guarantee the correct site status will be presented for a cancel or rebill of a pre-implementation billing period. This refers to a cancel where the rebill will pick up the current site status code and may not display the status of the original charge. If the original was energized but it is not de-energized, we will be canceling a period where the status was energized but rebilling to a status of de-energized.	Reject # 6044
Table 4-6 (12)	Ratchet Date/Time	ATCO CIS does not store these attributes until ATCO Gas' Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 4-6 (13)	Ratchet Period Months	ATCO CIS does not store this attributes until ATCO Gas' Phase 3 Tariff Billing Code implementation.	Reject # 6005

Item	Description	Presentation	Validation Failure
Table 4-9 (7)	One Time Charge Reference ID	This field will be null.	Reject # 6043
	Billed Quantity Issue	May not be as expected for periods prior to the elevation of the programs that change monthly to daily pricing. The change goes into effect November 17. Daily Rates to be in effect January 1, 2006. For example, determinants (e.g. Demand Value) may be prorated into smaller periods or a ratio of billing days in the period may be presented to support fixed charges.	General Note
	Time Calculation Type Incorrect	The Time Calc Type will always be a P prior to the elevation of the programs that change monthly to daily pricing. The change goes into effect November 17, 2006.	General Note
	Time Factor Incorrect	Time Factor will always be 1 prior to the elevation of the programs that change monthly to daily pricing. The change goes into effect November 17. This may result in proration of Component Billed Quantity.	General Note
Table 4.3.5 (6)	Heat Value Changes and effect on billing and DCM alignment	Prior to December 16, 2005 energy usage was calculated using rolling 30 day average heat values. After December 16, 2005 daily heat values will be used. Prior to Phase 3 for multi month periods the billing and DCM may not align due to rounding differences caused by using daily heat values over multi periods.	General Note
	Cancelled Tariff Bill Period Changes for a De-energized Site with no Idle Charges	ATCO CIS does not publish an EBL for a Tariff Bill Period for a site that is de-energized and has no idle charges. If the charges are cancelled, the retailer will receive a cancelled tariff bill period for a tariff bill period that he never received.	General Note

Table 2 – ATCO Gas Processing Prior to May 30, 2008, but After July 1, 2006

Item	Description	Presentation	Validation Failure
Table 3-1 (5)	Customer Switch	An exemption has been granted. CSA processing ability will commence at Phase 3.	General note
Table 3-1 (10)	MDM Metering Output	Prior to ATCO Gas' Phase 3 Tariff Billing Code implementation, not all DCMs will result in a usage split.	Dispute # 7009
Table 3-1 (11)	Off Cycle Meter Reading	Not all off-cycle reads are used for billing prior to ATCO Gas' Phase 3 Tariff Billing Code implementation.	Dispute # 7009
Table 3-1 (13)	Distribution Tariff Price Change (Energy Based Charges)	A usage period break will not occur to support distribution tariff price changes for energy based charges. Usage periods are prorated into Charge Periods that are split by a rate change. Splitting of the usage periods will be available following ATCO Gas' Phase 3 Tariff Billing Code implementation.	Reject # 6046 Dispute # 7009
Table 3-1 (15)	RRT Price Change	An exemption has been granted.	Long Term Exemption
Table 4-6 (12)	Ratchet Date/Time	ATCO CIS does not store these attributes until ATCO Gas' Phase 3 Tariff Billing Code implementation.	Reject # 6005
Table 4-6 (13)	Ratchet Period Months	ATCO CIS does not store this attributes until ATCO Gas' Phase 3 Tariff Billing Code Implementation.	Reject # 6005
Table 4.3.5 (6)	Heat Value Changes and effect on billing and DCM alignment	Prior to December 16 energy usage was calculated using rolling 30 day average heat values. After December 16 daily heat values will be used. . Prior to Phase 3 for multi month periods the billing and DCM may not align due to rounding differences caused by using daily heat values over multi periods.	General Note
	Cancelled Tariff Bill Period Charges for De-energized Site with no Idle Charges	ATCO CIS does not publish an EBL for a Tariff Bill Period for a site that is de-energized and has no idle charges. If the charges are cancelled, the retailer will receive a cancelled tariff bill period for a tariff bill period that he never received.	General Note

E3 ENMAX Power

ENMAX Power will not be using the tariff bill file format for adjustments which occur prior to the implementation date. These results will be handled through the current processes (settlement based billing and/or manual adjustments).

The period previous to the transition will be final billed through the Settlement based process (7 months after go-live), from the transition day forward each site in the EPC territory will be billed with the Tariff Bill File.

The transition will be enabled through the use of a profile which matches the final settlement profile to any reads requiring allocation. This will ensure no impact to Settlement results due to the transition to meter cycle billing.

The same profile will be used for any cancel / rebills that cross the transition date. The TBF will be used to bill these sites from the transition date forwards.

E4 EPCOR

To comply with the RDS Regulation EPCOR is changing its Tariff Billing system from a “vertical” (Market-wide daily tariff billing) to a “horizontal” (Cycle based tariff billing) model, and is aligning it to settlement and meter reads.

Given the nature of the system there will be no phased release model. The entire system will have to go live in a single release. Subsequent versions may be added or developed in the future but initially a single release will be required given that all modules are strongly interconnected.

However, all transactions initiated prior to the RDS implementation date will be completed in the current system. This will require a parallel operation of both systems while these transactions are completed. This period should not need to be longer than 8 months following the RDS implementation date, as this is when final settlement of pre-implementation transactions should occur.

The current system will be run monthly to process approximately seven final, three interim, and one initial-monthly run in order to close all periods initiated in the old system. This means that Retailers will receive in those dates a regular Tariff billing File as mandated by the Tariff Billing Code and an Adjustment file for pre-implementation charges with the current format.

The system must be rolled out to all stakeholder groups simultaneously as the live date will require the interaction of a variety of areas. This will require a great deal of coordination. However, training and Market testing can be phased in prior to the release date to assist in a smoother implementation.

E5 FortisAlberta

For FortisAlberta, pre-implementation charges are those charges that were incurred prior to the implementation of the Tariff Billing Code on July 1, 2005. Pre-implementation charges will be either:

- 1) Calculated and presented according to FortisAlberta’s current practices for any adjustments relating to charges prior to August 1, 2003.
- 2) Presented in a tariff bill file for adjustments relating to charges from August 1, 2003 up to and including June 30, 2005. Cancel information relating to this pre-implementation timeframe will match the original document with respect to the bill period, usage¹, demand and charge totals. However, charges that are rebilled for the same pre-implementation timeframe, as well as pre-implementation charges that span the July 1, 2005 cutover date, will follow the Tariff Bill Period exceptions noted in section E4.1. For these charge periods,

¹ In the August 1, 2003 to June 30, 2005 timeframe, usage was not reported for idle sites. In canceling preimplementation charges for this period for an idle site, a Usage Determinant (DU) record will be included with Usage Amount = 0 KWH.

FortisAlberta will cancel records utilizing a billing document number. This billing document number will be used to populate the Tariff Bill Period Cross Reference ID in the tariff bill period header record to reference pre-implementation charges already presented.

Sample tariff bill files are available upon request that represent pre-implementation charge presentation for each of the tariff billing events, cancel and rebills and during the transition period.

E5.1 Presentation Exceptions

The following section identifies where pre-implementation charges, from August 1, 2003, up to and including June 30, 2005, will not fully conform to Tariff Bill File production and validation rules.

Prior to Tariff Billing Code Implementation, FortisAlberta did not create a tariff bill period break for some of the events listed in Table 3-1 of the Code. As a consequence, FortisAlberta is unable to recognize certain tariff billing events that occurred in the past, and therefore the rebill of pre-implementation records will not fully meet the requirements of the Code.

Specific events in Table 3-1 of this Code impacted by this include:

- 1) Change in Site Status – prior to July 1, 2005, FortisAlberta did not consider a change in site status a tariff bill period event and a tariff bill period break will not occur on the effective date of a site status change (unless the effective timing of the site status change coincides with the effective timing of another tariff bill period event). Usage Determinant (DU) records will split according to the event and Tariff Charge (CH) records will split according to the event, if required. The result of this processing will be misalignment between tariff bill period, usage determinant, demand determinant and tariff charge records as well as usage determinant, demand determinant and tariff charge period gaps² within the tariff bill period.

FortisAlberta has implemented new functionality to capture and track site status changes as of early April 2005 to support processing of site status changes in following implementation of the Tariff Billing Code on July 1, 2005.

- 2) Rate Code Change – prior to July 1, 2005, FortisAlberta did not consider rate code changes neither as a tariff bill period event nor as a usage period event. Neither a tariff bill period break nor a usage period break will occur for any of the scenarios listed in Table 3-1 for this event on the effective date of the rate code change (unless the effective timing of the rate code change coincides with the effective timing of another tariff bill period event or usage period event). Tariff Charge (CH) records will split according to the event, if required. The result of this processing will be misalignment between tariff bill period, usage determinant, demand determinant and tariff charge records as well as usage determinant, demand determinant and tariff charge period gaps³ within the tariff bill period.

CSA processing and RRT Energy Rate Price Changes are tariff billing events dictated by the Tariff Billing Code and as a consequence will not impact pre-implementation charges.

² A tariff charge period gap will only occur if the tariff charge record expresses a component basis code 'E' or 'D'.

³ A tariff charge period gap will only occur if the tariff charge record expresses a component basis code 'E' or 'D'.

E5.2 Validation Exceptions

Tariff bill file content presented under the pre-implementation charge scenarios expressed above will not pass the following file format validation tests, where the Tariff Bill Period End Date in the Tariff Bill Period Header (TH) record is less than or equal to 20050630:

- 1) Element 20 – Usage Period/Tariff Bill Period Alignment
- 2) Element 22 – Usage Period Gap (within a Tariff Bill Period)
- 3) Element 23 – Demand Period/Tariff Bill Period Alignment
- 4) Element 25 – Demand Period Gap (within a Tariff Bill Period)
- 5) Element 26 – Charge Period/Tariff Bill Period Alignment
- 6) Element 28 – Charge Period Gap (within a Tariff Bill Period)

Further, tariff bill file content will not pass the following file content validation tests, where the Tariff Bill Period End Date in the Tariff Bill Period Header (TH) record is less than or equal to 20050630:

- 1) Element 9 – Tariff Bill Period Events
- 2) Element 10 – Usage Period Events

E.5.3 Presentation Exemptions

As FortisAlberta started producing TBF's with version 1.1 of the code and in version 1.3 of the code a change was made to display a code value for a miscellaneous determinant record rather than a description all of FortisAlberta's cancel/rebills for period prior to July 1, 2006 will include the mandatory code and will not match the description in the original TBF.

E 5.4 One time charge adjustments for cancel/rebills greater than 365 days.

Fortis Alberta will complete cancel/rebills on sites back to the date of the issue identified. If that date is greater than 365 days and the result of the cancel/rebill for the period in excess of 365 days is a debit, Fortis will put a credit one time charge on the site that will be dated for the last day of the first bill period outside of the 365 day period. The bill periods that are included are determined by looking at the bill period end dates of the TH's. Where the TH end date is greater than 365 days the bill period is considered to not be within the 12 month FortisAlberta terms and conditions. Cancel/rebill records will be included for all periods affected but not prior to 2003/08/01, the install date of the current billing system.

Reference F Optional Transactions

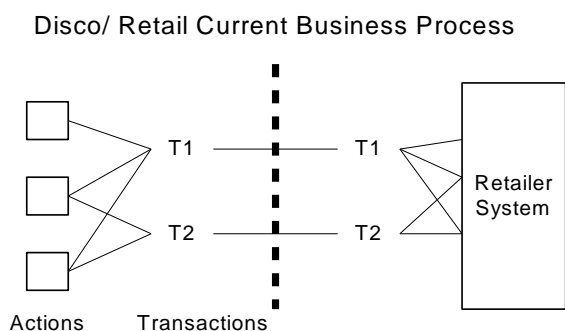
F1 Request for Information (RFI)

On an elective basis, EPCOR has proposed the following process and data transaction to enable synchronization of billing history between a distributor and retailer. This process is not mandated by this code and should be provided at the sole discretion of the distributor.

F1.1 Process Overview

The vertically integrated electric industry coordinated itself with legacy mainframe systems designed to ensure that data was accurate and consistent. In the new industry structure limited-scope transactions are used to communicate tariff billing events between distributors, retailers and the ISO. Retailers currently use these transactions to calculate Customer Bills.

Diagram F1-1 Disco/Retail Current Business Process



The Tariff Billing Code takes a first step, although not its main objective, towards achieving synchronization between systems. With the release of monthly files systems may get out of synch overtime, leading to potential disputes. Even though the code provides a dispute process to address potential issues between transacting parties, many of these disputes could be avoided by appropriate synchronization mechanisms. EPCOR believes a simple Request For Information transaction could be implemented, in which a retailer of record would be able to request site-specific information from a distributor. The return transaction from the distributor would include all available tariff and consumption information for that site for the period the retailer was the Retailer-of-Record. The retailer could then compare the information or simply loaded into their system, achieving synchronization.

F1.2 Request for Information (RFI) Transaction

The scope of this transaction is limited to a site or group of sites and to historic tariff and consumption information. Other synchronization methods for site characteristics, like broadband records have been introduced by EPCOR in the past and we will continue to develop them.

The RFI could have the following fields:

Table F1-1. Request for Information (RFI) Transaction Content

Element Sequence	Element (in sequence)	Data Type/Size	Description
1	Transaction Abbreviation	Char(3)	MANDATORY FIELD – Transaction abbreviation. This code must equal 'RFI'.
2	Record ID	Number(15)	MANDATORY FIELD – This must be a unique reference ID for each record produced by a distributor to allow the distributor or retailer to refer specifically to the data record. This value must be unique to a distributor.
3	Sender ID	Retailer ID Format	MANDATORY FIELD – Unique identifier for a retailer. This identifier must equal that of the retailer sending the transaction and must adhere to the rules as defined in Section 9 of the SSC.
4	Distributor ID	Distributor ID Format	MANDATORY FIELD – Unique identifier for the recipient (distributor). This identifier must equal that of the distributor receiving the transaction and must adhere to the rules as defined in Section 9 of the SSC.
5	Date Created	Datetime	MANDATORY FIELD – Date RFI transaction was created
6	Site ID	Site ID Format	MANDATORY – Unique identifier representing a site in the market. This value must adhere to the rules as defined in Section 9 of the SSC.
7	Requested Start Date	Date Format	OPTIONAL FIELD – If [null], the information will start from enrollment of the site by the retailer
8	Requested End Date	Date Format	MANDATORY FIELD – Date (Inclusive) the information is to end. The information will be provided for the tariff bill periods the retailer was the retailer-of-record

The returning information would include all available information for the site in a Tariff Bill File format. The proposed method is no more than the restatement of all previously published information by the distributor and it should not trigger a distributor's invoice, as it is for information purposes only. In restating previously published information, the distributor must refer to the record IDs of the original transaction contents.

Production Rules:

The following production rules apply for the RFI transaction:

- 1) Data contained within a RFI transaction must adhere to the field level rules stated in Table F1-1.
- 2) The RFI will take place on the day of arrival.
- 3) The RFI will be responded with a file following the Tariff Bill File formats established by the Tariff Billing Code with the exception of the name, where instead of TBF, TBI will be used.
- 4) The requested period must be for the span of time the requestor was the retailer-of-record.
- 5) Where the retailer is not the retailer of record, the information will be provided for a maximum of 12 months as long as the appropriate customer consent is obtained and submitted according to the Electric Utilities Act, Code of Conduct Regulation AR160/2003 Part 2 Division 2 Section 10 (2).
- 6) An RFI has a limit start date of April 1, 2005
- 7) Information contained in the TBI is limited to the most current information (i.e., no original or cancelled periods will be included where adjustment have been made).

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- 8) The TBI is limited to published Tariff Bill Periods (i.e., the Requested Start Date will be defaulted to the previous Tariff Bill Period Start Date and the Requested End
 - 9) Date to the next Tariff Bill Period End Date). Subsequent phases may allow more flexibility in the Start and End dates.

F2 Tariff Billing Sites Withheld (TSW) Transaction

On an elective basis, EPCOR has proposed the following data transaction to enable a distributor to inform a retailer, in an automated fashion, of sites that have been withheld from presentation in a published tariff bill file. This process is not mandated by this code and should be provided at the sole discretion of the distributor.

Note:

Section F2.1 and Table F2-1 in Appendix F, Optional transactions were moved to Section 4.12 of AUC Rule 004 version 2.0.

~~F2.1 Tariff Billing Sites Withheld (TSW) Transaction~~

~~The TSW transaction enables a distributor to inform a retailer of sites withheld from presentation in a published tariff bill file in an automated fashion. This transaction is utilized to communicate to a retailer of standard content validation tests and production failures for a specific site. The contents of the TSW transaction are provided in Table F2-1.~~

Table F2-1. — Tariff Billing Sites Withheld (TSW) Transaction Content

Element Sequence	Element (in-sequence)	Data Type/Size	Description
1	Transaction Abbreviation	Char(3)	MANDATORY FIELD — Transaction abbreviation. This code must equal 'TSW'
2	Retailer ID	Retailer ID Format	MANDATORY FIELD — Unique identifier for a retailer. This identifier must equal that of the retailer receiving the transaction.
3	Sender ID	Distributor ID-Format	MANDATORY FIELD — Unique identifier for the recipient (Distributor). This identifier must equal that of the distributor sending the transaction and must adhere to the rules as defined in Section 9 of the SSC.
4	Date Created	Datetime	MANDATORY FIELD — Date the TSW transaction was created
5	Record ID	Number(15)	MANDATORY FIELD — This must be a unique reference ID for each record produced by a distributor to allow the distributor or retailer to refer specifically to the data record.
6	Site ID	Site ID Format	MANDATORY — Unique identifier representing a site in the market. This value must adhere to the rules as defined in Section 9 of the SSC.
7	Commodity Code	Char(2)	MANDATORY — Standardized code representing commodity type. Refer to Appendix B for further information.
8	Zone ID	Zone ID Format	MANDATORY FIELD — Unique identifier for a zone within Alberta. Refer to Schedule B for further information.
9	Municipality ID	Number(4)	MANDATORY FIELD — Unique identifier representing a municipality in Alberta. Refer to Appendix B for further information.
10	REA Code	Char(4)	CONDITIONAL FIELD — Unique identifier representing a valid REA in Alberta. Refer to Appendix B for further information. If site is not within an REA Zone = [null].
11	Billing Cycle	Varchar(9)	MANDATORY FIELD — A value representing the billing cycle for a site. This value must match a distributor's published billing cycle.
12	Site Withheld Reason Code	Varchar(4)	MANDATORY FIELD — Populate with a standard code representing a site is being withheld due to failure of standard content validation tests or other internal production validation tests. See below for a list of acceptable values.
13	Additional Site Information	Varchar(50)	OPTIONAL FIELD — Free-form text field for providing additional site information

Production Rules:

The following production rules apply for the TSW transaction:

- 1) Data contained within the TSW transaction must adhere to the field level rules stated in Table F2-1.
- 2) Distributors must submit a TSW transaction on the same day as the tariff bill file.
- 3) A TSW transaction should be created for each Site Withheld Reason Code that has occurred.
- 4) Sites withheld are not included in the Tariff Bill File

F2.2 Site Withheld Reason Code for the TSW

A four-digit code representing Site Withheld Reason.

Table F2-2. Site Withheld Reason Codes

Table Ref ID	Site Production Reason Code	Site Production Reason Code Name
1	2500	Site withheld due to failure of standard content validation tests
2	2501	Site withheld due to failure of production validation tests
3	2502	Site withheld due to tariff calculation errors
4	2503	Other

F3 Tariff Bill Dispute Notification Transaction

F3.1 Tariff Bill Dispute Notification (TDN) Transaction

The TDN transaction enables a distributor to inform a retailer of the status and outcome of a Tariff Bill Dispute (TBD) transaction. This process is not mandated by the code and should be provided at the sole discretion of the distributor. The contents of the TDN transaction are provided in Table F3-1.

Table F3-1. Tariff Bill Dispute Notification (TDN) Content

Element Sequence	Element (in sequence)	Data Type/Size	Description
1	Transaction Abbreviation	Char(3)	MANDATORY FIELD – Transaction abbreviation. This code must equal ‘TDN’.
2	Record ID	Number(15)	MANDATORY FIELD – Unique identifier for the Tariff Bill Dispute Notification transaction. This identifier must be unique to a distributor.
3	Sender ID	Distributor ID Format	MANDATORY FIELD – Unique identifier for the sender. This identifier must equal that of the distributor or agent of the distributor sending the transaction and must adhere to the rules as defined in Section 9 of the SSC.
4	Retailer ID	Retailer ID Format	MANDATORY FIELD – Unique identifier for the recipient. This identifier must equal that of the retailer receiving the transaction and must adhere to the rules as defined in Section 9 of the SSC.
5	Date Created	Datetime Format	MANDATORY FIELD – Datetime the transaction was created.
6	Tariff Billing Dispute Record ID	Number(15)	MANDATORY FIELD – Reference to the Transaction ID of the TBD transaction containing the dispute that was investigated.
7	Ticket Number	Number(15)	OPTIONAL FIELD – Distributor issued ticket number for reference. The ticket number must be unique to a distributor.
8	Dispute Notification Status Code	Char(1)	MANDATORY FIELD – Code representing the status of the referenced TBD transaction. If a distributor acknowledges receipt of a TBD transaction = ‘A’. If a distributor rejects a TBD transaction = ‘R’. If a distributor completed the resolution of a TBD transaction = ‘C’.
9	Resolution Code	Number(4)	CONDITIONAL FIELD – Standard code to indicate the reason for rejecting a TBD transaction. Refer to Table F3-2 for a list of acceptable values. If Dispute Notification Status Code = ‘R’ or ‘C’, this field is MANDATORY.
10	Resolution Text	Char(255)	CONDITIONAL FIELD – Free-form text field for providing additional TBD rejection information to a retailer. If Resolution Code = ‘Other’, this field is MANDATORY.

Production Rules:

The following production rules apply for the TDN transaction:

- 1) Data contained within the TDN transaction must adhere to the field level rules stated in Table F3-1.
- 2) Where a distributor has stated they will implement the TDN transaction, a TDN transaction must be created for all TBD transactions received by the distributor.
- 3) TBD transactions received by a distributor may be analyzed over a span of business days according to the timeframe prescribed by Table 2-1, and as a result, TDN transactions may be produced over the same timeframe.
- 4) Where the Dispute Notification Status Code = ‘C’, the cancel/rebill information for the site will be available to the retailer either
 - a) in an off-cycle tariff bill file on the same day the TDN is issued for the most recently billed period, or
 - b) in the next scheduled tariff bill file for that site for a prior billing period.

F3.2 Tariff Bill Dispute Resolution Code

A four-digit code representing tariff bill dispute resolution reason.

Table F3-2. TDN Resolution Codes

Table Ref ID	Transaction Resolution Code	Transaction Resolution Name
1	3500	Rejected – Invalid File Format
2	3510	Rejected – Invalid Reason Code
3	3520	Rejected – Duplicate TBD
4	3530	Rejected – Other
5	3540	Completed – Cancel / Rebill
6	3550	Completed – Other

F4 Site Cycle Change Transaction

The site cycle change transaction provides a notification to a retailer of record of site cycle changes. If a retailer does not accept future dated SCC transactions, it may depend solely on a distributor’s published site cycle catalogue. This transaction does not supersede a distributor’s obligation to maintain a current site cycle catalogue or its website. The contents of the SCC transaction are provided in Table F4-1.

Table F4-1. Site Cycle Change Transaction

Element Sequence	Element (in sequence)	Data Type/Size	Description
1	Transaction Abbreviation	SCC	MANDATORY FIELD – Transaction Abbreviation. This code must equal ‘SCC’.
2	Date Created	Datetime Format	MANDATORY FIELD – Latter of the time the transaction was created or last modified.
3	Distributor ID	Distributor ID Format	MANDATORY FIELD – Unique identifier for the sender. This identifier must equal that of the distributor or agent of the distributor sending the transaction and must adhere to the rules as defined in Section 9 of the SSC.
4	Retailer ID	Retailer ID Format	MANDATORY FIELD – Unique identifier for the recipient. This value must equal that of the intended retailer receiving the transaction and must adhere to the rules as defined in Section 9 of the SSC.
5	Site ID	Site ID Format	MANDATORY FIELD – Unique identifier representing a site in the market. This value must adhere to the rules as defined in Section 9 of the SSC.
6	Billing Cycle	Varchar(9)	MANDATORY FIELD – Unique identifier for a distributor’s billing cycle.
7	Effective Date	Datetime Format	MANDATORY FIELD – Date the site began to bill on the cycle
8	Future Billing Cycle	Varchar(9)	OPTIONAL FIELD – Unique identifier for a distributor’s cycle indicating a site’s future billing cycle.
9	Future Effective Date	Date Format	CONDITIONAL FIELD – Effective date of the future billing cycle. If Future Billing Cycle is populated, this field is MANDATORY.

Production Rules

The following production rules apply for the SCC transaction:

- 1) Data contained within the site cycle catalogue file must adhere to the field level rules stated in Table F4-1.
- 2) Only one record per site can be included in the file.
- 3) A valid transaction is effective on the Effective Date.
- 4) The SCC transaction will be optional for distributors and retailers. Where distributors and/ or retailers elect not to support this, they can rely on the Site Cycle File alone.

Reference G Cancel/Rebill Methodology

In the absence of a standard market cancel/rebill approach for adjusting previously sent tariff charges, the purpose of Appendix H is to provide retailers in the Alberta electricity and natural gas markets with visibility into the cancel/rebill position and approach employed by each distributor in making adjustments for usage and tariff charges previously sent to a retailer.

G1 ATCO Electric

ATCO Electric will perform cancel/rebills for all of the periods from the point of the error forward to, and including, the current period.

G2 ATCO Gas

ATCO Gas will perform cancel/rebills for all of the periods from the point of the error forward to, and including, the current period.

G3 ENMAX Power Corporation

Enmax Power Corporation will perform cancel/rebills for all of the periods in sequence from the point of the error forwards. All of the events originally billed will also be rebilled, thereby preserving the original periods and only adding new breaks where required. This rebill will occur once the adjusted market transactions have been sent.

G4 EPCOR

EPCOR will perform full cancel/rebill for only the affected periods from the point of the error.

G5 FortisAlberta

FortisAlberta will perform cancel/rebills for all of the periods in sequence from the point of the error forward.

Reference H CSA Transaction Processing Methodology

In the absence of a standard market approach for processing CSA transactions, the purpose of Appendix H is to provide retailers in the Alberta electricity and natural gas markets with visibility into the position and approach employed by each distributor in processing CSA transactions received from retailers.

H1 ATCO Electric

ATCO Electric will not accept CSA transactions with a future “Requested Effective Date”. ATCO Electric will accept CSA transactions with a “Requested Effective Date” in the past as long as the requested date does not precede the last billing date or the date of any charges created for that site.

H2 ATCO Gas

ATCO Gas will not accept CSA transactions with a future “Requested Effective Date”. ATCO Gas will accept CSA transactions with a “Requested Effective Date” in the past as long as the requested date does not precede the last billing date or the date of any charges created for that site.

H3 ENMAX Power Corporation

Enmax Power Corporation (EPC) will only accept backdated CSA transactions from Retailers as long as they were the Retailer of record and the transaction is backdated to a maximum of 5 calendar days. EPC will not reject any CSA received backdated more than 5 calendar days, but will process it effective the date received. If EPC receives a CSA from any Retailer other than the current Retailer, EPC will send a CSR with a rejection code of 8002.

Enmax Power Corporation will not accept any future dated CSAs.

H4 EPCOR

EPCOR will only allow for backdated CSA transactions that are within 2 business days of the effective date. EPCOR believes it is in the best interest of the end customer and the retailer to allow for a ‘grace period’ after the effective date. This will help accommodate transmission errors, processing delays, and late calls received from the customer. EPCOR’s official business rule is that the CSA must be received by 4 p.m., two business days after the effective date in the CSA transaction. So, if the retailer/end-customer requests that the CSA effective date be September 17th, the transaction would be accepted for processing up to 4 p.m. on September 19th. Ultimately, this will help ensure that the end customer receives a bill up to the date that they expected.

Conversely, EPCOR will not accept future dated CSA transactions. Accepting future dated transactions would increase the amount of storage and logic that would be needed to handle and maintain data in ‘staging tables’. Moreover, accepting future dated CSA’s would open the door to the possibility of canceling these transactions, for which there is no process. As a business practice, it is expected that retailers will hold any future dated CSA transactions and send them on the effective date. At this point, if there are any problems with transmitting the CSA, the 2-day grace period should be sufficient time to ensure that the CSA is sent successfully using the effective date as the cut off date of the bill.

H5 FortisAlberta

FortisAlberta will not provide the option of backward or future dating CSA transactions for version 1.0 of the Tariff Billing Code. However, FortisAlberta would consider providing this service in future versions of the Tariff Billing Code if required.

Reference I RSP's Approach to Identifying Sites Affected by an RRT Energy Rate Price Change

In the absence of a standard market approach for identifying sites affected by an RSP's RRT energy rate price change, the purpose of Appendix I is to provide distributors in the Alberta electricity and natural gas markets with visibility into the approach employed by each RRT retailer to identify sites affected by an RRT energy rate price change.

I1 ATCO I-Tek/Direct Energy

ATCO I-Tek/Direct Energy segments their sites by retailer ID and hence each distributor would be able to identify RRT sites by retailer ID.

I2 ENMAX Energy

Enmax Energy segments their sites by business function ID and hence each distributor would be able to identify RRT sites by business function ID.

I3 EPCOR Energy

EPCOR segments their sites into unique retailer IDs to support their business needs hence each distributor would be able to identify RRT sites by retailer.