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| <p><b>Newmarket-Tay Power Distribution Ltd.</b></p> <p><b>Conditions of Service</b></p> | <p><b>Number:</b> NT POWER COS-230-07</p> <p><b>Issue Date:</b> July, 2007</p> |
| <p><b>Metering</b></p>  | <p><b>Next Review Date:</b> February, 2015</p>                                 |

**1. Preamble:**

Metering requirements are as required in Section 5 of the *Distribution System Code* and the *Retail Settlement Code*, and any further requirements specified by Newmarket-Tay Power Distribution Ltd. (NT POWER).

**2. General:**

Refer to NT POWER Standing Instruction 405 – 003 “Metering Requirements and Specifications” and Standing Instruction 300 – 001 “Construction of Underground Residential Electrical Distribution Systems”.

See NT POWERCOS-350-01 Embedded Generation for details regarding Net Metering generation.

**3. Instrument Transformers:**

Refer to NT POWER Standing instruction 405 – 003 “Metering Requirements and Specifications”.

**4. Metering:**

**4.1 Interval Metering**

**4.1.1 Installation:**

An *interval meter* will be installed on *electrical services* under the following conditions:

- a) The annual average peak *demand* by the *Consumer* is greater than 200 Kw:

NT POWER will identify those *Consumers*, which meet this criterion and provide notification to them. The notification will consist of a letter explaining the requirement for an *interval meter* under the pertinent *Ontario Energy Board Codes* and guidelines, an estimate of the cost of the

installation, the *meter installation* requirements and a time frame for completing the installation.

- b) New services with an installed capacity of 300Kw or greater:

The requirement for an *interval meter* will be identified in the *Distribution Services Agreement* with the *Consumer* and will include an explanation of the requirement, an estimate of the cost of the installation, and the *meter installation* requirements.

- c) At the request of the *Consumer*:

The *Consumer* is to contact the Manager – Technical Services of NT POWER in writing with the request for the installation of an *interval meter*. NT POWER will respond with the *meter installation* requirements and an estimate of the costs of the installation. Upon confirmation by the *Consumer* that the installation is to proceed, the *Consumer* shall make the communications link described in Section 4.2 available before NT POWER will commence any work on the installation.

#### 4.1.2 Metering Equipment

In addition to the requirements contained in Sections 2 and 3, *interval meter installations* will require the provision of a communications link at the metering cabinet. The link shall be a dedicated analogue phone line. The *consumer* will be responsible for the installation and ongoing monthly costs of operating the phone line. The phone line will be analogue direct dial voice quality, active 24 hours per day, and activated prior to service energization.

Existing *meter installations* being retrofitted with an *interval meter* may require upgrading of related metering equipment including the current or potential transformers. In these cases, the *interval meter* will not be installed until the required upgrades are complete.

#### 4.1.3 Costs and Payment

Upon receipt of the estimate for the *meter installation*, the *Consumer* will remit this amount to NT POWER. Once the installation is complete, NT POWER will prepare a statement for the actual costs incurred and invoice or refund any difference.

Costs associated with maintaining the *meter installation*, excluding costs that are the responsibility of the *Consumer* as expressly

provided for elsewhere in NT POWER's *Conditions of Service* will be the responsibility of NT POWER.

#### **4.2 Non-Interval Metering:**

NT POWER shall provide and install, at the *Consumer's* expense, and maintain, at NT POWER's expense, a *meter installation* for retail settlement billing purposes for each *Consumer* connected to NT POWER's *distribution system*.

### **5. Meter Reading**

#### **5.1 Interval Meters**

##### **5.1.1 Meter Reading Schedule**

*Interval meters* are interrogated each business day.

##### **5.1.2 Access to Meter Data**

*Interval meter* data, is typically posted on the NT POWER Interval Meter Data internet site the next business day after the meter is interrogated. Access to the data is through the use of a secure personal identification number (PIN) issued by NT POWER.

*Consumers* who are *interval metered* and have enrolled with a *retailer* will have their *interval meter* data sent to the appropriate *retailer* via the Ontario Retail Settlement Electronic Business Transaction System in accordance with the *Ontario Energy Board's Retail Settlement Code*.

No other access to data is available.

#### **5.2 Non – Interval Meters**

##### **5.2.1 Meter Reading Schedule**

Non-interval meters are read on a monthly cycle. The Billing Department prepares an annual schedule of meter reading that averages a 30 day read cycle.

The meter reading schedule is updated on a monthly basis to reflect any deviations and their reason.

##### **5.2.2 Missed and Unobtainable Reads**

An estimate report shall be prepared for each reading cycle, of all accounts which have been estimated two or more times. Field staff

will attempt reading these accounts one to three days prior to the next scheduled read date at nights or on weekends. All obtained readings and reading notes on access for future reads will be entered into the meter reading handheld data recorder. Estimate reads that could not be obtained will have an appointment arranged with the *Consumer*. Appointment reads will be entered into the cycle meter reading data on day three.

### **5.2.3 Access to Meter Data**

*Consumers* who have enrolled with a *retailer* will have their data sent to the appropriate *retailer* via the Ontario Retail Settlement Electronic Business Transaction System in accordance with the *Ontario Energy Board's Retail Settlement Code*.

Meter data will be posted on the NT POWER internet site the business day after the billing date for which the data is valid. Access to the data is through the use of a secure personal identification number (PIN) issued by NT POWER.

## **6. Final Meter Reading**

### **6.1 Termination of Contract for Distribution Service**

NT POWER conducts final meter readings on the second and fourth business day of each week. The meter will be read on the date of contract termination if it is a final read day, else the first final meter read day following.

### **6.2 Switch to Retailer Supply or Switch in Retailer Supply**

In all cases, the final read date will be the next scheduled read date following the end of any contest or blackout periods as described in the *Retail Settlement Code* for *Consumer* enrollment with a *retailer*.

### **6.3 Return to Standard Supply Service**

In all cases, the final read date will be the next scheduled read date following the end of any blackout periods as described in the *Retail Settlement Code*.

## **7. Faulty Registration of Meters:**

Revenue metering data shall be checked for reasonableness by NT POWER before being passed on to the settlement system. If the data does not satisfy preset validation criteria, a trouble call shall be issued to resolve any potential measurement problems and estimated data shall be provisionally substituted for the suspect data until the trouble call is resolved.

If resolution of the trouble call confirms a problem with the revenue metering, the estimated data shall be edited as required then passed on to the rest of the settlement process.

If the revenue metering data is confirmed to be correct, the estimate shall be manually undone. On other occasions the data may have to be manually adjusted for other reasons.

## **7.1 Interval Meters:**

This section applies to revenue metering data collected by the MV90 data collection system used by the Contractor providing NT POWER *interval meter* reading services for use in settlement of retail transactions in NT POWER's licenced service area.

The meter in any of these installations transmits the data to be validated. The general methodology for validating the data is by comparing it to data previously gathered. Data previously gathered is often referred to as historical data.

When metering data fails validation, NT POWER must estimate and fill the resulting gap. If a *Consumer* is unsatisfied with the estimate produced by NT POWER, the *Consumer* is required to participate in NT POWER's meter data dispute resolution process. If still not satisfied, the *Consumer* has the right to ask *Measurement Canada* to resolve the dispute.

The validation criteria are based on the historical load pattern and alarms from the meter.

The values specified below are based on operating experience and shall be used for data validation.

### **7.1.1 Validation Requirements**

The following list of checks and criteria shall be considered by NT POWER for validation of data collected from the meter:

1. Meter Readings Vs. Load Profile Type M
2. Intervals Found Vs. Intervals Expected
3. Time Tolerance
4. Number of Power Outage Intervals
5. Missing Intervals
6. Hi Limit on Interval Demand
7. Hi Limit on Energy

8. CRC/ROM/RAM Checksum
9. Meter Clock Overflow
10. Hardware Reset
11. Time Reset
12. Data Overflow on Interval
13. Comparison to Previous Day
14. Zero Interval Tolerance
15. Number of Channels
16. Changed Device ID

This list will occasionally be adjusted by NT POWER.

### **7.1.2 Estimating:**

Should validation indicate that data from the meter might be incorrect; the MV90 software will automatically prepare a provisional estimate. The estimate shall be prepared based on the historical load pattern.

#### **7.1.2.1 Gaps One Hour or Less**

The data in channels 1, 2, 3, and 4 shall be estimated using linear interpolation. A straight line, joining the *demand* reading at the beginning of the interval to the *demand* reading at the end of the interval, shall be used to estimate the *demands* in the intervening intervals.

#### **7.1.2.2 Gaps Over One Hour**

The gap will have a start and stop time and a day type: weekday, weekend, and holiday. The *energy* data for the three previous comparable periods (start and stop times and day type match) shall be compared.

If the meter has not been installed long enough, three comparable periods may not be found. In this case, NT POWER shall contact the *Consumer* for information upon which an estimate may be based.

If the installation is a *Consumer's*, the maximum *energy* shall be used as the basis of standard MV90 load shape scaling.

Where a *generation facility* is lacking alternate or check metering, the minimum *energy* shall be used as the basis of standard MV90 load shape scaling if the *Consumer* can prove that the *generator* was in production during the period. Otherwise the estimate shall be zero.

### 7.1.3 Editing

#### 7.1.3.1 Background

Manual substitution and scaling routines shall be used for editing. Editing may be required when the trouble call process determines the cause and resolution of the problem.

Occasionally a *meter installation*, even though it is otherwise operating normally, may provide incorrect data owing to events such as power system switching or application of mobile *emergency back-up*. Manual editing would then be required to revise the incorrect data.

#### 7.1.3.2 No Reliable Data Available

If the data from the meter is incorrect or unobtainable, NT POWER's Meter Department shall either:

- a) Provide an adjustment factor that truly reflects the actual transaction, or
- b) Ask the Billing Department to prepare an estimate based on historical data.

The submission of an adjustment shall consist of;

- i) A multiplier; and/or an optional additive constant;
- ii) The specific period to which the adjustment applies; and
- iii) Documentation supporting the adjustment.

NT POWER shall retain the documentation of the adjustment to support audit requests that may be initiated by the Consumer.

#### 7.1.3.3 Problem Repaired

If the Meter Department is able to repair the problem while on site, and chooses to submit an adjustment, the adjustment shall be based on "as-found" and "as-left" readings.

The adjustment factor shall be confirmed by comparison with an independent measurement made or available on site, such as panel metering, SCADA, performance metering, cross phase readings taken from test links supplied by protective relaying instrument transformers, or a primary clip-on ammeter reading.

#### 7.1.3.4 Problem Not Yet Repaired

If the problem will be resolved within time lines specified in the *Ontario Energy Board's Retail Settlement Code* and data can still be obtained from the main, the Meter Department may provide an adjustment factor to be applied to the metering data collected.

The Manager – Technical Services shall approve all edit adjustments.

### 7.2 Non-Interval Meters

This section applies to revenue metering data collected by the handheld data collection system used by the Contractor providing NT POWER meter reading services for use in settlement of retail transactions in NT POWER's licensed service area.

The meter in any of these installations is manually read and the data entered into a handheld data recorder and validated. A request read file is generated in the utility billing system for the cycle reads to be obtained (a "DCI" file). Once the cycle reads have been obtained and validated, a read data file is created to return the meter reading data to the utility billing system (a "DCO" file). The general methodology for validating the data is by comparing it to data previously gathered.

The data is also validated by the CIS billing system when it is uploaded from the Itron system.

When metering data fails validation, NT POWER must estimate and fill the resulting gap. If a *Consumer* is unsatisfied with the estimate produced by NT POWER, the *Consumer* is required to participate in NT POWER's meter data dispute resolution process. If still not satisfied, the *Consumer* has the right to ask *Measurement Canada* to resolve the dispute.

The validation criteria are based on the historical load pattern.

The values specified below are based on operating experience and shall be used for data validation.

#### 7.2.1 Validation Requirements

The following list of checks and criteria shall be considered by NT POWER for validation of data collected from the meter:



Handheld Variance

HI1

LO1

HI2

LO2

Should validation indicate that the meter reading might be incorrect, the following actions will be taken:

a) HI1/LO1 Fail:

The meter reader will verify the meter dial the handheld has identified, and accept the reading.

b) HI2/LO2 Fail:

The meter reader will re-enter the meter number to verify the location is correct, re-enter the meter reading to verify the first read entry was correct, capture the meter register in a digital image and accept the reading.

When the meter reading route is completed, a free form survey of all readings failing validation will be made to verify that a digital image was taken and that the reading is correct.

### **7.2.2 Estimating & Editing**

Should validation indicate that data from the meter might be incorrect; a provisional estimate shall be prepared. The estimate shall be prepared based on the historical load pattern.

## **8. Meter Data Dispute Resolution**

### **8.1 Meter Data Complaints**

Upon receiving a high bill complaint, the *Consumer's* account is to be reviewed by a Customer Service Representative to identify the areas of concern. Should reviewing the existing billing history fail to resolve the problem to the *Consumer's* satisfaction, a trouble call will be issued.

A *residential service Consumer* may have the option of having a check meter installed in series with the existing meter depending on their service configuration. The check meter is to be installed for a minimum of one week.

The Meter Technician will review the findings and report them to the Consumer Service Representative for discussion with the *Consumer*.

## 8.2 Dispute Testing

Should a *Consumer* be dissatisfied with the results of the metering data complaints resolution process, the meter can be removed and sent to *Measurement Canada* for dispute testing. The dispute test is subject to a service charge as detailed in NT POWER's schedule of approved rates and charges. The *Consumer* will be contacted by *Measurement Canada* and informed of the time, location and date of testing. A Government Inspector will conduct testing and the results forwarded directly to the *Consumer*. The *Consumer* has 90 days to appeal the results of the test.

Installations containing current or voltage transformers must be tested by *Measurement Canada* on site (known as 'in-situ testing') prior to NT POWER personnel removing the meter. Once the in-situ test has been completed, the meter can be removed and sent to *Measurement Canada* for testing. The *Consumer* will be notified of the time, location and date of the test and will be forwarded the results directly.

Following a test, meters with correct registration returned to NT POWER will not be placed in services until the end of the 90-day *Consumer* appeal period.

In the event a meter fails testing, the service charge will be waived and a billing adjustment will be prepared by NT POWER and sent to *Measurement Canada* for approval prior to adjusting the *Consumer's* account.

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