Summary Validation, Estimation and Substitution Rules for
QH Interval Metering

Profile Data Services
ESB Networks

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History of changes to document

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Draft V.0.7		Working versions of document	G.McDonald / S.Wynne	
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1.   Introduction

This document covers the rules to be followed, for both validation and estimation of data, for customers with remotely read QH (quarter-hour) interval metering.

The software tool in use is MV90, which manages the automatic collection and validation of the interval data.   If the validation criteria are not met, the data from the associated meter are designated as rejected, until they can be examined and cleared.

Where an estimate is required, it is generated using MV90, based on the rules in this document.

2.   Validation

2.1   Initial Validation of Meter Details

An initial validation of meter details is carried out before metering is approved for billing purposes under the settlement system or under DUoS, or following a meter change or CT / VT ratio change in any site already used for such billing.
This process checks that the correct meter is being polled, that the expected KW / KVAr data are present, and that the various multipliers in use are correct.

2.2   Ongoing Validation of Meter Details

On making contact with a metering site, the following checks are automatically completed;
–   Ensure serial number of meter contacted is correct
–   Check that the recorder time is correct, and if not, correct it.

2.3   Ongoing Validation of Meter Interval Data

On receipt of the collected meter interval data, the following additional automatic checks are completed. Any data files not meeting the criteria are rejected, and the problem is corrected:

2.3.1 Pulse Overflow
If a pulse overflow occurs in any of the intervals, data is marked for correction, and the meter is flagged for possible re-programming

2.3.2 Interval Tolerance
If the calculated number of time intervals between the start and stop times of the file doesn't match the actual intervals recorded, investigation is carried out.

2.3.3 Critical Change
Comparisons made between the current and previous data files;
-   check for change in the number of channels,
-   check for change in the units-of-measure codes
-   search for inconsistencies (gap / overlap) between the stop time of the previous file and the start time of the new data file.
-   check for inconsistent meter readings.

2.3.4   <u>High / Low Limit Check – Demand</u>
If the peak demand for any interval exceeds the defined high usage limits (pre-set per customer), data are rejected by the High/Low Limit validation parameter.

2.3.5   <u>Extended Validation Report</u>
Extended validation allows for additional Hi/Lo comparisons to be made based on defined extended parameters. Must be activated at channel level in order to operate – available for use if required.

2.3.6   <u>Usage Tolerance</u>   (Cumulative Meter Reading vs. Meter Interval Data)
If the energy usage recorded on the cumulative register in a meter does not match the energy usage recorded as interval data, within the set tolerance of 2% (of the specific block of data just collected), the data are rejected and investigated.

2.3.7   <u>Power Outage</u>
If more than six intervals of power outage are found in a data file, the file is rejected and matter is investigated by contacting the appropriate Region, to confirm whether or not the data is valid.

2.3.8   <u>Short / Long Interval</u>
If time length of an interval identified as different from other intervals (too long or short) in the data file – data rejected. [meter hardware dependent]

2.3.9   <u>Meter Clock Error</u>
If internal meter hardware clock error results in invalid date or time, data are rejected.   [meter hardware dependent]

2.3.10 <u>Hardware Reset Occurred</u>
If internal meter hardware reset is detected – occurrence is flagged to permit review. [meter hardware dependent]

2.3.11 <u>Watchdog Timeout</u>
If watchdog timer is tripped or activated – occurrence is flagged. [meter hardware dependent]

2.3.12 <u>Time Reset Occurred</u>
Any time change in meter is recorded and stored as interval status information for review [meter hardware dependent]

2.3.13 <u>Test Mode</u>
If test mode activated on meter – status information stored for review. [meter hardware dependent]

2.3.14 <u>CRC / ROM / RAM Checksum + Parity Error</u>
Internal status checks relating to read / write function within meter automatically carried out. [meter hardware dependent]

2.3.15 <u>Main vs. Redundant Meter Tolerance</u>
Where applicable, main vs. redundant meter comparisons are made, and if the difference is outside the set tolerance, the data are rejected and the problem followed up.

2.3.16 <u>Zero Interval Tolerance</u> (Load Recorders)
If more than the specified number of zero intervals occurs in any data file, the data are rejected and the cause is investigated.

2.4   Annual Verification of Meter Reading vs. Meter Interval Data

In line with the requirements of the Meter Code, an annual verification is carried out for certain sites. This involves comparing cumulative register readings taken on site with the energy usage recorded as interval data.

The verification is required for sites whose interval data is used for billing purposes

All relevant Load Recorders (without cumulative registers) are read on site every 12 months.

A sample group of the remaining relevant multi-function meters is included in the check process also.

The difference between successive cumulative register readings and the total of the meter interval data for the same 12-month period should be within a tolerance of 0.1% for the totality of the period.

Where practical, the actual site reads required for this exercise can be provided from the scheduled Major Meter Test process.

3.   Data Estimation & Substitution

3.1   Requirement for Data Estimation and Substitution

Data estimation is required to be undertaken in situations where metered data are incomplete, has been irretrievably lost or cannot be obtained within the timeframes required. Data substitution is required where the data obtained are erroneous.

3.2   Data Estimation & Substitution Rules

Data will be estimated / substituted when required using one of the following methods in the order specified below:

3.2.1 Check Meter
Where a check meter is installed and functional, data requiring estimation/substitution will be taken directly from the check meter;

3.2.2 Gap up to 2 hours duration
If the gap in data is 2 hours or less point-to-point linear interpolation will be used to estimate/substitute the data. Intervals containing a power outage are not used as end points for interpolation.

3.2.3 Gap over 2 hours in duration
If the gap in data is greater than 2 hours then the interval data are constructed using the average load shape based on the three most recent "similar" days (i.e. the same day of week) with valid data (not estimated). Similar days for holidays will be weekends or other holidays.

If "similar" days are not available, a combination of "like" days (either another weekday, or else a weekend / holiday) may be used as appropriate.

Estimates are generated automatically from algorithms within the data collection system. The three 'similar' days are accessed by selecting three contiguous weeks of data.

Where actual register readings from the meter are available, an adjustment factor shall be calculated and applied to the data to ensure that the total estimated consumption is equal to the total actual consumption.

If there is no historical data that can be used, the data are estimated manually and the process and assumptions documented fully.

Even after estimated data has been used for settlement purposes, real data or a more accurate estimation supported by registers may become available. Where this occurs, and where the aggregation / settlement process can handle multiple versions of data, and is capable of ongoing re-aggregation, then the various versions of the data will be made available to the Aggregation / Settlement process. Otherwise, normal dispute procedures apply.