NETWORK CODE VALIDATION RULES

Version 3.0

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1 Introduction

This is the document referred to in Section M 1.5 of the Network Code Principal Document. It does not form part of the Network Code.

1.1 This document describes the validation rules which will be applied to meter and corrector readings and associated data before it is applied to the Sites and Meters Database of UK Link. All parameterised values are subject to amendment. Any changes will be notified to System Users.

1.2 The validation described in this paper will be in addition to that used to determine that the data is in accordance with the file specification and system requirements.

1.3 The validation refers to cyclic and non cyclic meter readings.

1.4 The validation will be undertaken by the UK Link system. It is also the standard that will be required as a minimum for any meter reading files provided by a System User opting for an Unbundled meter reading service.

1.5 There are five potential entry points for meter readings. These are

1.5.1 Hand Held Terminal (HHT) Transco Bundled Service

1.5.2 Meter Reading File (MRREADS) provided by a System User, Unbundled or Part Bundled

1.5.3 Single Input Manual Entry, used for re-input of rejected readings

1.5.4 Bulk Screen Input (Contingency only)

1.5.5 Dataloggers

2 Transco Meter Reading Agency HHT (on Site) Validation

2.1 Validation for this input will be performed at the time of data capture on the HHT.

2.2 The meter reading will be checked to ensure that it is within a specified range either side of an estimated reading. This is known as an Inner Tolerance Range (ITR). The estimated reading will be calculated using the consumption history and the AQ of the meter,

2.3 If the meter reading input is outside the ITR, the meter reader will be required to re-input the meter serial number. If this number is that on the HHT (the correct meter) then he will be required to re-input the reading. This confirms the accuracy of the first reading or corrects an error on the first attempted input. If the meter number differs a meter exchange will be initiated. Similar checks are to be performed on corrector

readings.

2.4 A check will be made on the number of digits for a meter reading i.e. six digits must be input for a six dial meter. No alteration to the number of dials can be made on the HHT. Any anomalies discovered will be reported as they generally signify meter exchanges.

3 System User / UK Link Validation

3.1 All readings from HHT's or MRREADS files (including those supplied by System Users using an Unbundled or Part Bundled meter reading service) will be subject to tolerance checking on UK Link when received. Any failures will be reported on the MRREJECT tabulation for examination and correction. For System Users providing their own MRREADS using the Unbundled meter reading service tolerance checking will not result in a reject. The examined rejections will be input to the Sites and Meters Database using a single screen manual input. The same validation will be performed but at this stage it will be possible to override the check.

3.2 All 4 dial meter readings will be subjected to a round the clock test to detect possible instances where a meter has made a complete revolution of the dials between readings. It will also check for negative consumptions if a meter reading follows an over-estimate

The term Round the Clock (RTC) refers to the number of times the meter or corrector has gone "through the zero's" i.e. has moved from 9999 to 0001. The use of this indicator and the reading will permit the volume of gas to be calculated as well as detecting any reversal of readings following an earlier over-estimate. A detailed explanation of the logic is given in Appendix A.

3.3 For consumptions up to 10, 000 cf there will be no tolerance checking,

3.4 For consumptions over 10,000 cf a further tolerance check will be applied to ensure that the reading is within a wider tolerance range of the estimated reading. This will be known as the Outer Tolerance Range (OTR). If the reading fails this test it will not be applied to the system but will be reported on MRREJECT for clerical examination. Readings that have been confirmed as correct although outside the ITR will be applied to the system unless they fall the OTR cheek.

3.5 Tolerance ranges will be based on the volume of gas passed through the meter and will be parameterised. The proposed initial settings for UK Link are shown in Appendix B.

3.6 Where a corrector is fitted additional checks will be performed.

3.6.1 To ensure that the corrector is functioning accurately a check will be made against the corrector tolerance limits. If the following calculation produces a result that is outside the parameters of the corrector tolerance limits the corrector reading will be rejected.

Calculated Correction Factor

Fixed Correction Factor

Where:

Calculated Correction Factor is the factor calculated by the corrector based on measured conditions i.e:

Corrector Corrected Volume

Meter Volume

and,

The Fixed Correction Factor is that established for the site.

Typical tolerance ranges for UK Link are shown in Appendix B. The values used in UK Link will be similar to these.

3.6.2 To ensure that the corrector is reading meter pulses correctly the following calculation will be performed.

Meter Volume - Uncorrected Corrector Volume

Where this results in an out of tolerance figure the reading will be rejected.

The tolerance check applied in this test will be dependent upon the pulse value of the meter. The initial values for UK Link are shown in Appendix B. The values will be parameterised

4 Dataloggers

Dataloggers provide daily readings. The following tests will be performed.

4.1 A completeness test to ensure that all the readings expected have been received from either Metretek or Metscan. A report will be issued if any expected readings are not received. In addition a report will be issued if an unsolicited reading is received.

4.2 An instrument configuration test i.e. to ensure that the corrector and the meter reading are received where a corrector is fitted. A report will be issued if any expected readings are not received. In addition a report will be issued if an unsolicited reading is received.

4.3 The calculation in 3.6.1 (above) will be performed using the Uncorrected Corrector Volume in place of the Meter Volume. If this calculation produces a value outside the parameters of the corrector tolerance limit the corrector reading will be rejected. Typical tolerance ranges for UK Link are shown in Appendix B.

4.4 If 3 or more consecutive zero consumption readings are received a test will be performed to compare with the corresponding period in the previous year. If the consumption in the previous year was not zero then a report will be produced for investigation.

4.5 An "And" test will be undertaken so that if any daily consumption is:

(a) outside the 30 day average non zero consumption by plus 3.5 Standard Deviations,

and

(b) in excess of twice the average daily consumption for that meter i.e. ((AQ/365)* 2)

the read will be rejected and reported for investigation. A D-7 estimate will be used whilst the investigation takes place. As data is acquired, test (b) will be based upon the maximum daily consumption in the previous year and the tolerance factor adjusted, accordingly.

5 Non Cyclic Meter Readings

5.1 Non cyclic meter and corrector readings (Including opening readings and check readings) will be validated with the same rules as cyclic readings.

5.2 The consumption tolerance limits set out in Appendix B will be used for all non cyclic readings whether received from System Users using the Unbundled or Part Bundled meter reading service or from Transco's own meter reading service provider.

5.3 The RTC test as described in Appendix A will be applied to non cyclic readings

5.4 A reading received from a System User will be treated as a firm reading. Any previously received customer reading will be treated as a firm reading for tolerance checking purposes.

6 Further Information

If you require any further information in relation to the material contained within this document, please contact the Metering Manager at the address shown below:

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7 APPENDIX A - 'ROUND THE CLOCK' INDICATORS

REQUIREMENTS AND DEFINITIONS

1. The term 'round the clock' will be used in a single context to denote that a meter or corrector has passed through all its zero's and will not necessarily imply that the meter or corrector has made a complete revolution of all its dials (i.e.i.e. more than 10,000 hundred cubic feet (hcf) on a four dial meter, 100,000 hcf on a five dial meter etc).

   The indicator is to be used for all meters and correctors but in the remainder of the text the term meter will be used for ease of understanding.

2. This means that in the circumstance:

2.1 Present Reading 6000

Previous Reading 5000

If the volume passing through the meter is 1,000hcf then the RTC indicator will be 0.

If the volume passing through the meter is 1 1,000hcf (because the meter has made one complete revolution of all its dials) the RTC indicator will be 1. Here the meter has gone through the zero's once.

If the volume passing through the meter is 21,000hcf (because the meter has made two complete revolutions of all its dials) the RTC indicator will be 2. Here the meter has gone through its zeros twice.

2.2 Present Reading 0999

Previous Reading 9999

If the volume passing through the meter is 1,000hcf then the RTC indicator will be 1 as the meter has gone through the zero's once.

If the volume passing through the meter is 11,000hcf (because the meter has made one complete revolution of the dials) the RTC indicator will be 2 as the meter has gone through the zero's twice.

If the volume passing through the meter is 21,000hcf (because the meter has made two complete revolutions of all the dials) the RTC indicator will be 3 as the meter has gone through the zero's three times.

3. All RTC indicators of 2 or above will be reported for investigation on MRREJECT.

4. The test will also look for readings moving backwards because of a previous over-estimate.

4.1 Present Reading 9910 Actual

Previous Reading 0010 Estimate

If the present meter reading is lower than the previous meter reading this requires the meter to have passed backwards through the zero's the RTC indicator will be -1.

The previous estimate is clearly an over estimate if the test shows that a volume of -100hcf is more credible than a consumption of +9900hcf

4.2 Present Reading 5900 Actual Previous Reading 6000 Estimate

If the present meter reading is lower than the previous meter reading this does not require the meter to have passed backwards through the zero's the RTC indicator will be 0.

The previous estimate is clearly an over estimate if the test shows that a volume of -100hcf is more credible than a consumption of +9900hcf

NB: A customer reading will be treated as an actual reading for the purpose of this test. The negative consumption indicator will only be used if the previous reading is an estimate.

5. The test to detect whether a meter has made more than one complete revolution of its dials will be applied only to 4 dial meters or where the previous reading is an estimate. For meters with 5 or more dials the reading will assumed to have gone forward unless the previous reading is an estimate.

8 APPENDIX B - TOLERANCE RANGES

A: Consumption Tolerance Ranges

Table 1: Inner Tolerance Range

Estimated Consumption cf	Tolerance (±%)
10,001 - 50,000	150
50,001 - 100,000	120
100,001 - 200,000	90
200,001 - 350,000	60
350,001 - 500,000	30
500,001 - 99,999,999	10

Table 2: Outer Tolerance Range

Estimated Consumption cf	Tolerance (± %)
10,001 - 50,000	300
50,001 - 100,000	240
100,001 - 200,000	180
200,001 - 350,000	150
350,001 - 500,000	150
500,001 - 99,999,999	75

B: Corrector Tolerance Limits

Table 3: (Typical Values to be applied throughout Gas Year)

Lower Limit	Upper Limit	Number of pulses
0.85	1.12	>100
0.5	1.3	⩽100

C: Meter/Corrector Pulse Validation

Table 4:

Meter Pulse Value	Meter and Uncorrected Corrector Gas Consumption Difference
10cf	±400cf (40 pulses)
100cf	±800cf (80 pulses)
1000cf	±3000cf (3 pulses)

If the Meter Pulse value is unknown the default test will be on 1000cf/Pulse tolerances.

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