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Code Subsidiary Document No. 0203:

Meter Read Submission: Validation

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Definitions

Unless expressly stated otherwise, for the purposes of this CSD:

(a) terms defined in the Wholesale-Retail Code Part 1 (Objectives, Principles and Definitions) shall apply; and

(b) capitalised terms relating to the titles of Data Items or Data Transactions described in CSD 0301 (Data Catalogue) shall have the meaning attributed therein.

For the purposes of this CSD only, the following capitalised terms shall have the following meaning:

Definitions	
Term	**Definition**
"Candidate Daily Volume" or "CDV"	the volume in m^3/day determined by the Market Operator as part of the Volume validation process described in Section 2.6 of this CSD;
"Nominal Maximum Design Volume"	the maximum Volume that the Market Operator considers should have been supplied to a meter, with reference to the table in Appendix C of this CSD;
"PEDV"	the previous value of CDV, determined by the Market Operator as part of the Volume validation process described in Section 2.6 of this CSD;
"Rollover Detection Algorithm"	the algorithm specified in Appendix B of this CSD which the Central Systems use to classify the status of a Meter Rollover associated with a Meter Read; and
"Rollover Status"	the status determined by the Market Operator as part of the Meter Rollover validation process described in Section 2.5 of this CSD.

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1. Purpose and scope

1.1 Overview

1.1.1 This document sets out the validation process performed by the Market Operator on receipt of Meter Reads, to ensure that the Meter Reads are fit for use in the Settlement Process. Where a Meter Read does not meet these validation requirements, the Market Operator shall notify the relevant Trading Party that further investigation is required.

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2. Meter Read validation description

2.1 Overview

2.1.1 The process descriptions in this CSD should be read in conjunction with the process diagrams and the interface and timetable requirements in each subsequent section. The step references appear beside each action or decision symbol in the process diagram. References shown thus TXXX.M relate to the associated Data Transaction, as set out in the CSD 0301 (Data Catalogue).

2.1.2 The Market Operator responds to all Data Transactions submitted by Trading Parties with a T109.M (Accept or Reject). The T109.M notifies either rejection of the Data Transaction submitted or acceptance of the Data Transaction submitted. If the Data Transaction is rejected an appropriate error code is provided in the T109.M. If the Data Transaction is accepted and the Market Operator needs to provide additional information back to the Trading Party, it will send the relevant information in a different Data Transaction in addition to the T109.M sent to notify acceptance. For simplicity of presentation, the T109.M may not be identified explicitly in the process steps, process diagrams and interface and timetable requirements.

2.1.3 In addition to sending an acceptance or rejection, the Market Operator shall set the Meter Settlement Flag for each successfully validated and accepted Meter Read to True, denoting that the Meter Read shall be used in the Settlement Process.

2.1.4 This process shall be run by the Market Operator on receipt of a Meter Read in Data Transaction T104.W (Submit Meter Details), T105.W / T105.R (Submit Meter Read), or T117.W (Submit Meter Exchange) in accordance with CSD 0202 (Meter Read Submission: Process), CSD 0104 (Maintain SPID Data) or CSD 0106 (Non-Market Meters), as applicable.

2.1.5 Meter Read Types and Meter Read Methods are set out in CSD 0202 (Meter Read Submission: Process).

2.1.6 Under Section 4.11 of the Market Terms, the Market Operator is required to carry out validation checks in respect of:

(a) SPID data, transaction and Meter Read Date validation;

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(b) rollover detection and validation; and

(c) Volume validation.

2.1.7 In addition to the validation described above, the Market Operator shall provide a Meter Reads Analysis Report in accordance with Appendix D of this CSD 0203 and CSD 0302 (Standing Reports and Data Extracts). The Market Operator shall include:

(a) in respect of Water Wholesalers and Water Retailers, details of the meters at Supply Points to which they are Registered;

(b) in respect of Sewerage Wholesalers and Sewerage Retailers:

(i) details of meters at Supply Points to which they are Registered; and

(ii) details of meters at Water Services Supply Points which are paired to Sewerage Services Supply Points to which they are Registered.

2.1.8 The Data Owner shall treat the provision of this Report as a request by the Market Operator to the Data Owner to review the Data in accordance with Section 4.2.4 of the Market Terms.

2.2 SPID data and transaction validation

2.2.1 The purpose of SPID data and transaction validation is to ensure that the combination of the following Data Items is a valid combination of Data Items within the Data Transaction containing the Meter Read:

(a) Trading Party;

(b) SPID;

(c) Meter Read Type;

(d) Meter Read Method; and

(e) the combination of Meter Manufacturer and Manufacturer Meter Serial Number.

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2.2.2 SPID data and transaction validation also checks that the Data Transaction content is valid (e.g. that the Meter Read value is populated).

2.2.3 A check is also undertaken to ensure that the Meter Read Date is valid. A Meter Read shall be rejected if:

(a) the Meter Read Date contained within the Data Transaction is later than the date of submission of the Data Transaction; or

(b) the Meter Read Date is earlier than the date of a previous Meter Read.

2.2.4 A Meter Read with the same Meter Read Date as a previously accepted Meter Read shall either be accepted or rejected depending on the combination of Meter Read Types of the previous and new Meter Reads. Section A4 of Appendix A of this CSD sets out this check in more detail.

2.2.5 A submitted Meter Read shall be rejected by the Market Operator in any of the following circumstances:

(a) the submitted Meter Read is an Initial Read and there is a previous Meter Read for the same meter of any Meter Read Type;

(b) a Final Read has previously been accepted for the same meter;

(c) there are no previous Meter Reads for the meter, and the submitted Meter Read is not an Initial Read;

(d) the submitted Meter Read is a Transfer Read and a Regular Cyclic Read has previously been submitted with a Meter Read Date that is later than the most recent Registration Start Date and earlier than the Meter Read Date of the submitted Transfer Read; or

(e) the combination of Meter Read Type and Meter Read Method is not a valid combination in accordance with CSD 0202 (Meter Read Submission: Process).

2.2.6 Any rejection shall be notified using Data Transaction T109.M (Accept or Reject) with the appropriate error code. The error codes are set out in CSD 0301 (Data Catalogue).

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2.2.7 Where a Meter Read with the same Meter Read Date as a previously accepted Meter Read is accepted (in the limited circumstances set out in Appendix A), the Market Operator shall set the Meter Settlement Flag of the previous Meter Read to False, denoting that the previous Meter Read has been superseded by the new Meter Read and shall no longer be used in the Settlement Process or to support the validation of any subsequent Meter Read.

2.2.8 Where a Wholesaler wishes to replace an earlier Initial Read or Final Read, it may only do so in accordance with CSD 0105 (Error Rectification & Retrospective Amendments).

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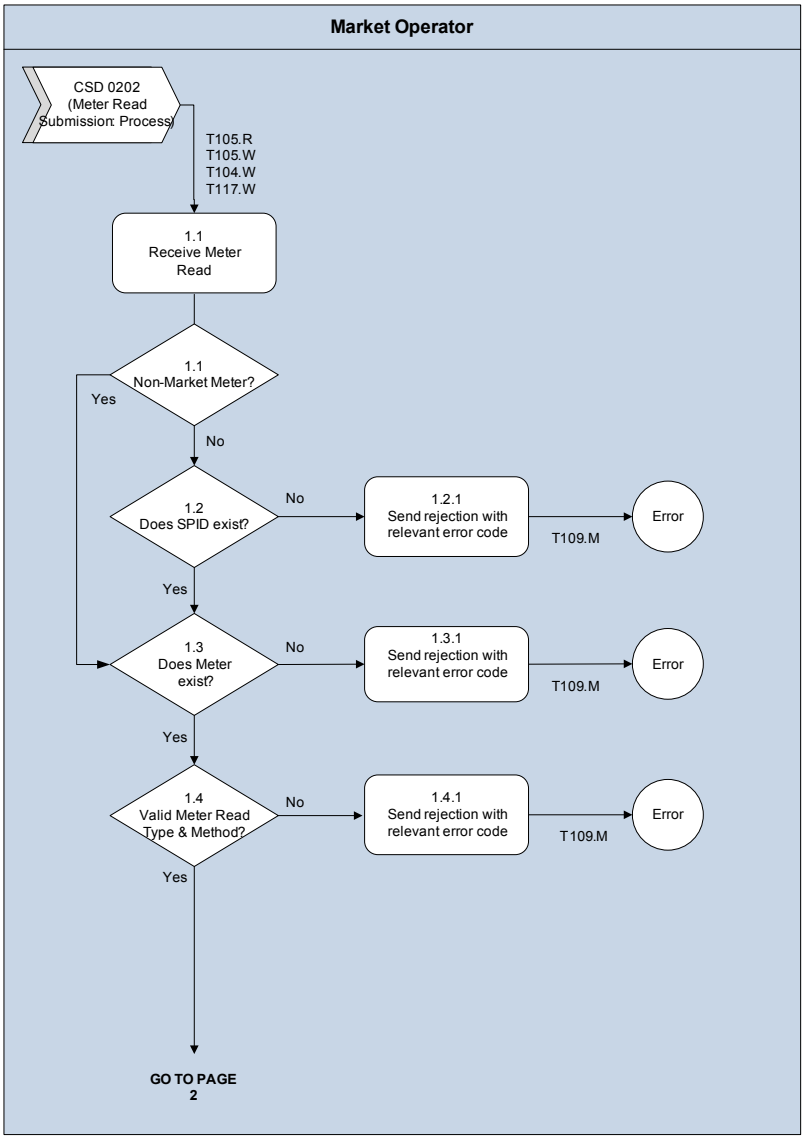
2.3 Process diagram

SPID data and transaction validation (page 1/2)



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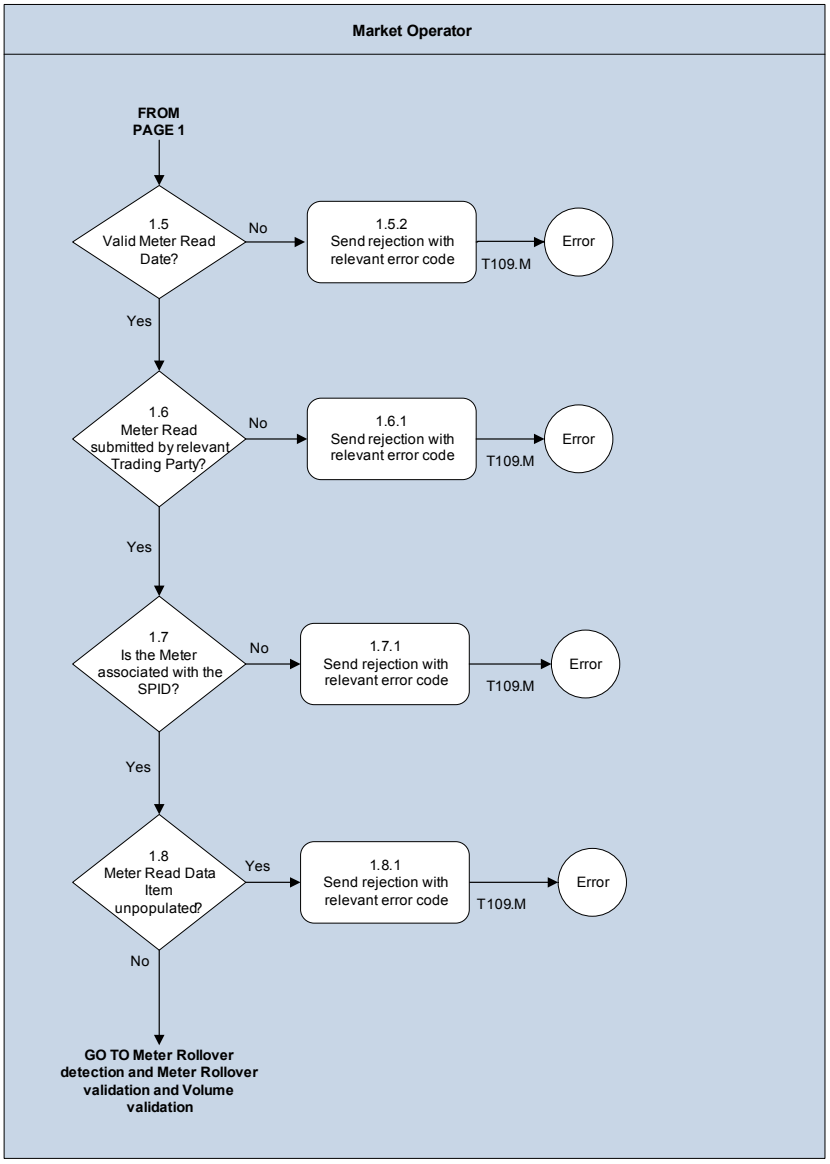
SPID data and transaction validation (page 2/2)



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2.4 Interface and timetable requirements: SPID Data and transaction validation

Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.1	A	Receive Meter Read If Meter Read relates to a Non-Market Meter then go to step 1.3 below.	Market Operator		Ad hoc		T104.W, T105.W, T105.R or T117.W
1.2	D	Is the SPID an existing SPID?	Market Operator				
1.2.1	A	If the SPID is not a known SPID, send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109.M
1.3	D	Is the combination of Meter Manufacturer and Manufacturer Meter Serial Number an existing combination of Meter Manufacturer and Manufacturer Meter Serial Number?	Market Operator				
1.3.1	A	If the combination of Meter Manufacturer and Manufacturer Meter Serial Number is not a known combination of Meter Manufacturer and Manufacturer Meter Serial Number, send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109.M

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.4	D	If the submitted Meter Read is an Initial Read and there is a previous Meter Read for the same meter of any Meter Read Type; or If a Final Read has previously been accepted for the same meter; or If there are no previous Meter Reads for the meter, and the submitted Meter Read is not an Initial Read; or If the submitted Meter Read is a Transfer Read and a Regular Cyclic Read has previously been submitted with a Meter Read Date that is later than the most recent Registration Start Date and earlier than the Meter Read Date of the submitted Transfer Read; or	Market Operator				
		If the combination of Meter Read Type and Meter Read Method is not a valid combination in accordance with CSD 0202 (Meter Read Submission: Process); then go to 1.4.1. Otherwise go to 1.5					

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.4.1	A	Send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator				
1.5	D	If the Meter Read Date is later than the date of submission of the Meter Read; or If the Meter Read Date is before the date of a previous Meter Read; or If the Meter Read Date is the same as the Meter Read Date for a previously submitted Meter Read and the table in Appendix A of this CSD specifies that the Meter Read should be rejected; then go to 1.5.1, otherwise go to 1.6	Market Operator				
1.5.1	D	Send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator				

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.6	D	Is the SPID registered to the Trading Party that submitted the Meter Read? If so, go to 1.7 otherwise go to 1.6.2; or Is the Meter Read Type 'T' and is the corresponding SPID for the other Service Category registered to the Trading Party that submitted the Meter Read; or Is the Meter Read Type 'T' and is the Trading Party that submitted the Meter Read the Incoming Retailer for the SPID or the Incoming Retailer for the corresponding SPID for the other Service Category ? If yes in any of the cases above, go to 1.7 otherwise go to 1.6.1	Market Operator				

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.6.1	A	If none of the following apply: the SPID is registered to the Trading Party that submitted the Meter Read; where the Meter Read Type is 'T', the corresponding SPID for the other Service Category is registered to the Trading Party that submitted the Meter Read; or where the Meter Read Type is 'T', the Trading Party that submitted the Meter Read is the Incoming Retailer for the SPID or the Incoming Retailer for the corresponding SPID for the other Service Category; then send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109.M
1.7	D	Is the combination of Meter Manufacturer and Manufacturer Meter Serial Number associated with the SPID? if so, go to 1.8, otherwise go to step 1.7.1	Market Operator				

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
1.7.1	A	If the combination of Meter Manufacturer and Manufacturer Meter Serial Number is not associated with the SPID, send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109.M
1.8		If the Meter Read is unpopulated go to 1.8.1, otherwise go to 1.9	Market Operator				
1.8.1	A	If the Meter Read is unpopulated, send rejection with relevant error code. See Section 2.9 (Validation failure - error transactions)	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109.M
1.9	A	Go to Meter Rollover detection and validation and Volume validation (see Sections 2.5 and 2.6 of this CSD)	Market Operator				

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2.5 Meter Rollover detection and Meter Rollover validation

Meter Rollover detection

2.5.1 Following the submission of any Meter Read which passes SPID data and transaction validation, the Market Operator shall use the Rollover Detection Algorithm (RDA) (set out in Appendix B of this CSD) to determine whether a Meter Rollover has occurred.

2.5.2 The algorithm shall return (internally to the Central Systems) one of three states:

(a) "Not a rollover";

(b) "Rollover"; or

(c) "Indeterminate".

Meter Rollover validation

2.5.3 The Market Operator shall then compare the results of the Rollover Detection Algorithm with the Rollover Indicator optionally submitted with the Meter Read by the submitting Trading Party, and shall determine a Rollover Status (internally to the Central Systems) as shown in the table below.

	Rollover Indicator = True	**Rollover Indicator = False**	**Rollover Indicator = Not set**
RDA = "Rollover"	Rollover Status set to AGREE Rollover Flag set to TRUE	Rollover Status set to DISAGREE	Rollover Status set to AGREE Rollover Flag set to TRUE
RDA = "Not Rollover"	Rollover Status set to DISAGREE	Rollover Status set to AGREE Rollover Flag set to FALSE	Rollover Status set to AGREE Rollover Flag set to FALSE
RDA = "Indeterminate"	Rollover Status set to AGREE Rollover Flag set to TRUE	Rollover Status set to AGREE Rollover Flag set to FALSE	Rollover Status set to QUERY

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2.5.4 Where the Rollover Status is either

(a) DISAGREE; or

(b) QUERY

the Market Operator shall reject the Meter Read and send a T109.M (Accept or Reject) containing the appropriate error code.

2.5.5 For the avoidance of doubt, where the Market Operator rejects a Meter Read as a result of either DISAGREE or QUERY, the Market Operator shall not retain a copy of the Meter Read for the purposes of checking a Re-Read.

2.5.6 Where the Rollover Status is AGREE, the Market Operator shall set the Rollover Flag based upon the table above, record that the Meter Read has been submitted (to allow potential future Re-Reads) and proceed to Volume validation.

2.5.7 It should be noted that the Meter Rollover detection and Meter Rollover validation described in this CSD will not identify instances where a meter has been incorrectly installed such that it runs backwards. Where a Trading Party identifies such an issue, any resulting data errors should be corrected in accordance with CSD 0105 (Error Rectification & Retrospective Amendments).

Review of Rollover Detection Algorithm

2.5.8 The Market Operator shall keep the Rollover Detection Algorithm under continuous review to:

(a) ensure that it continues to be appropriate in view of the characteristics of the meters in the market at any point in time;

(b) ensure that there are never any false positive detections of meter rollover;

(c) ensure that there are never any false negative detections; and

(d) reasonably minimize the number of indeterminate responses.

2.5.9 The Market Operator shall provide a minimum of one report to the Panel each Year on whether the algorithm remains appropriate.

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2.5.10 If, at any time, the Market Operator considers that a change is required to the algorithm, it shall progress this as a Change Proposal pursuant to the change process set out in the Market Arrangements Code.

2.6 Volume validation

2.6.1 The Market Operator shall not carry out Volume validation in respect of an Initial Read, because there shall be no relevant Candidate Daily Volume associated to such a Meter Read.

2.6.2 The Market Operator shall not carry out Volume validation in respect of a Re-Read.

Calculation of Candidate Daily Volume

2.6.3 The Market Operator shall establish the following values in respect of the Meter Read being validated:

R_1 is the value of the submitted Meter Read;

R_0 is the value of the previous Meter Read;

R_{-1} is the value of the second most previous read and may or may not exist;

flag has the value 1 if the Rollover Flag determined in accordance with Section 2.5 is TRUE; and *flag* has the value 0 if the Rollover Flag is FALSE;

n is the number of digits on the meter dials;

D_1 is the date of the submitted Meter Read;

D_0 is the date of the previous Meter Read; and

D_{-1} is the date of the second most previous read and may or may not exist

2.6.4 In the case where another Meter Read has already been accepted with the same Meter Read Date as the Meter Read currently being validated, the previously accepted Meter Read shall not be taken into account in establishing R_0 and R_{-1}. R_0 must always have an earlier Meter Read Date than the Meter Read being validated.

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2.6.5 The Market Operator shall calculate the Candidate Daily Volume supplied to a meter as:

$$CDV = \frac{(R_1 - R_0) + flag * 10^n}{(D_1 - D_0)}$$

2.6.6 Where the expression $D_1 - D_0$ is used above, representing the difference between two dates, this should be interpreted as the difference in days between the two dates.

2.6.7 The Market Operator shall use the calculated value of CDV to validate the relevant Meter Read using the "threshold validation" and "Nominal Maximum Design Volume validation" checks described below.

Threshold validation

2.6.8 The Market Operator shall establish PEDV, being the previous value of CDV.

2.6.9 Where there is only one (1) previous Meter Read (i.e. R_0 exists but R_{-1} does not exist), the Market Operator shall calculate the PEDV as the Meter Volume Daily Estimate *(MVDE)* specified in Appendix A3 of CSD 0207 (Charge Calculation, Allocation and Aggregation) to establish a base Volume for threshold validation.

2.6.10 Where there are two (2) or more previous Meter Reads, the Market Operator shall calculate the PEDV as:

$$PEDV = \frac{(R_0 - R_{-1}) + flag * 10^n}{(D_0 - D_{-1})}$$

where *flag* should be interpreted as whether a rollover occurred between the reads R_{-1} and R_0.

2.6.11 The Market Operator shall check the value of the Candidate Daily Volume calculated for a meter using the formulae below. The Meter Read shall either be accepted with an OK response or rejected with an error code, as per the following table:

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PEDV Value	CDV Value	Acceptance (OK) or Error Code
PEDV<=0	CDV= 0; SPID Vacant = True	*OK*
	CDV= 0; SPID Vacant = False	*Error code*
	-3 <CDV<0	*Error code*
	CDV<= -3	*Error code*
	0 <CDV	*Error code*
0 <PEDV	CDV= 0; SPID Vacant = True	*OK*
	CDV= 0; SPID Vacant = False	*Error code*
	-3 <CDV< 0	*Error code*
	CDV<= -3	*Error code*
	CDV< 0.2 * PEDV	*Error code*
	2 * PEDV<CDV	*Error code*
	0.2 * PEDV<= CDV<= 2 * PEDV	*OK*

2.6.12 Note that in calculating the CDV and PEDV values in respect of Volume validation, no account is taken of either Temporary Disconnection or Vacancy.

2.6.13 CSD 0202 (Meter Read Submission: Process) describes the use of Re-Reads.

2.6.14 Error codes are set out in CSD 0301 (Data Catalogue).

Nominal Maximum Design Volume validation

2.6.15 The Market Operator shall check the Candidate Daily Volume calculated for a Potable Water Meter, Non-Potable Water Meter or Private Water Meter by comparing its value to the value of the Nominal Maximum Design Volume that the Market Operator considers should have been supplied to the meter. This test shall

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not apply to Sewerage Meters or Private Trade Effluent Meters. Where the test applies, the Market Operator shall derive the value of that Nominal Maximum Design Volume from the Physical Meter Size, as notified by the relevant Wholesaler and with reference to the table in Appendix C of this CSD. The Market Operator shall consider the value of the Candidate Daily Volume to be validated if it is less than the value of the Nominal Maximum Design Volume that should have been supplied to that meter, divided by the number of days in the relevant Year, as shown by the following formula:

$$CDV < (MAC_K / DIY)$$

Where:

CDV is the value of the Candidate Daily Volume that the Market Operator calculated for the meter;

MAC_K is the value of the Maximum Volume that could have been supplied to the meter *K* (as derived from the relevant Physical Meter Size); and

DIY is the number of days in the Year.

2.6.16 Once a Meter Read has passed all validation checks, the Market Operator shall distribute the Meter Read to Trading Parties in accordance with CSD 0202 (Meter Read Submission: Process).

2.6.17 The Market Operator shall also set the Meter Settlement Flag for each validated and accepted Meter Read to True, denoting that the Meter Read shall be used in the Settlement Process.

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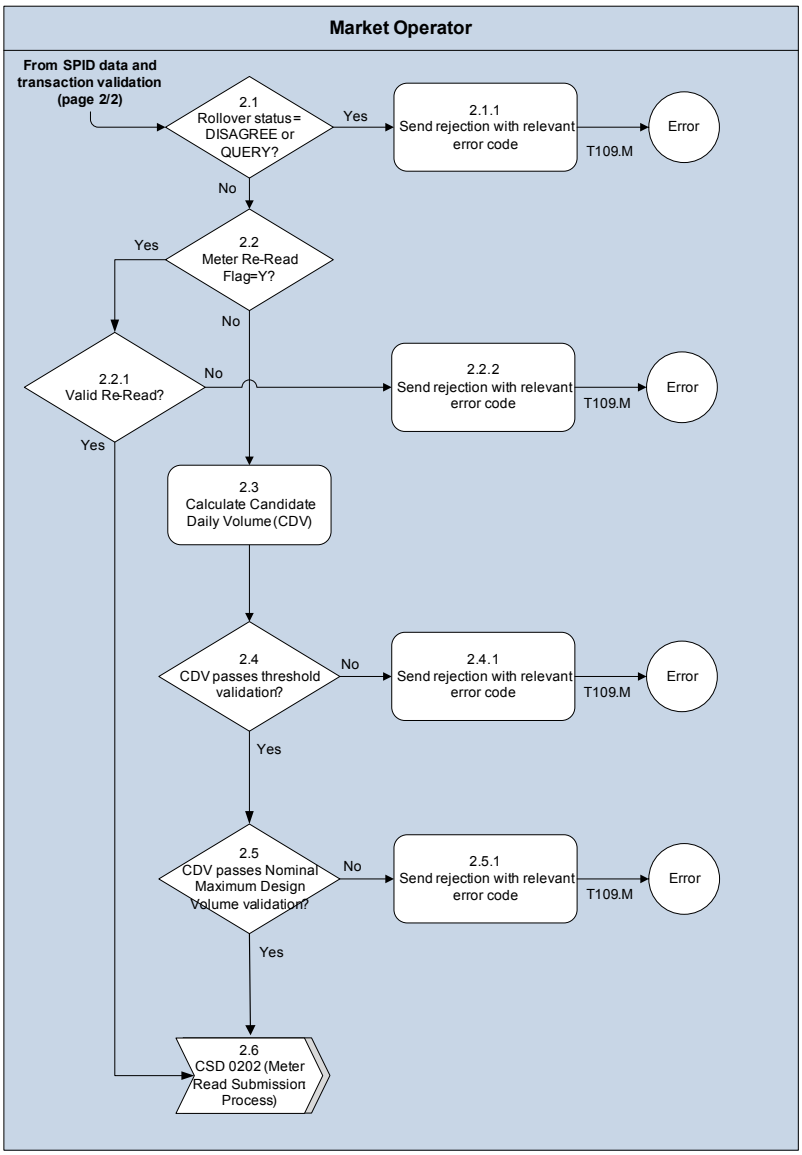
2.7 Process diagrams

Meter Rollover detection and validation and Volume validation



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2.8 Interface and timetable requirements: Meter Rollover detection and validation and Volume validation

Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
2.1	D	Is Rollover Status = DISAGREE or QUERY? If so, go to 2.1.1. Otherwise, go to 2.2	Market Operator				
2.1.1	A	Send rejection with relevant error code.	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109M
2.2	D	Is the Meter Re-Read Flag = 'Y'? If so, go to 2.2.1.	Market Operator		Ad hoc		T104.W, T105.W, T105.R or T117.W
2.2.1	D	Is there a previous Meter Read with all the same values which was rejected as a result of Volume validation? If so, go to 2.6. Otherwise go to 2.2.2	Market Operator			For the avoidance of doubt, rejection as a result of Rollover validation failure does not allow a Re-Read to be accepted.	
2.2.2	A	Send rejection with relevant error code.	Market Operator	Retailer or Wholesaler		Error codes set out in CSD 0301 (Data Catalogue)	T109M

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Step	Action/ Decision	Process Step	From	To	Time parameter	Comments	Data Transaction
2.3	A	Calculate Candidate Daily Volume in accordance with Section 2.6 of this CSD	Market Operator				
2.4	D	Does the Candidate Daily Volume fail the threshold validation steps described in Section 2.6 of this CSD? If so go to 2.4.1, if not go to 2.5	Market Operator				
2.4.1	A	Send rejection with relevant error code	Market Operator			Error codes set out in CSD 0301 (Data Catalogue)	T109.M
2.5	D	Does the Candidate Daily Volume fail the Nominal Maximum Design Volume validation steps described in Section 2.6 of this CSD? If so go to 2.5.1, if not go to 2.6	Market Operator				
2.5.1	A	Send rejection with relevant error code	Market Operator			Error codes set out in CSD 0301 (Data Catalogue)	T109.M
2.6	A	Distribute Meter Read in accordance with CSD 0202 (Meter Read Submission: Process)					

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2.9 Validation failure – rejection transactions

2.9.1 In the event that a Meter Read fails validation, the Market Operator shall notify the Trading Party who submitted the Meter Read, using Data Transaction T109.M (Accept or Reject).

2.9.2 Meter Reads that fail Meter Rollover detection and validation shall not be retained by the Market Operator. However, Meter Reads that fail threshold validation shall be retained by the Market Operator in order to support the validation of any Re-Read in accordance with CSD 0202 (Meter Read Submission: Process). Any such rejected and retained Meter Reads shall not form part of the Meter Read history and shall not be used in any subsequent volumetric charge calculations.

2.9.3 The Data Transaction for each failed Meter Read shall contain the Data Items set out against the relevant Data Transaction in the Data Catalogue.

2.9.4 The error codes are fully defined in the Data Catalogue.

2.9.5 On receipt of a T109.M (Accept or Reject) the Trading Party shall investigate the error as follows:

Rollover detection and validation failure

2.9.6 Where the rejection of the Meter Read is due to the Market Operator being unable to determine the Rollover Status (i.e. “Indeterminate”), the Trading Party should submit a new Meter Read with the Rollover Indicator appropriately set. The Meter Read should not be resubmitted as a Re-Read.

2.9.7 Where the rejection of the Meter Read is due to the Market Operator disagreeing with the Rollover Indicator provided with the Meter Read, the Trading Party should update the information and submit a new Meter Read. Where the Trading Party believes the Meter Read and Rollover Indicator to be correct they should notify the Market Operator to make appropriate amendments to the Meter Read history to the extent permitted by CSD 0105 (Error Rectification and Retrospective Amendment) to ensure that the failure does not re-occur, before submitting a new Meter Read with the same data values.

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Volume validation failure

2.9.8 Where the rejection of the Meter Read is due to Volume validation failure and the Trading Party believes the Meter Read to be correct, the Trading Party should resubmit the Meter Read as a Re-Read, or should otherwise update the information required to ensure the failure shall not reoccur and submit a new Meter Read.

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A. Appendix: Validation failure types

A full description of each validation failure type is provided below. CSD 0301 (Data Catalogue) sets out all of the error codes and Data Items.

A.1 Unrecognised SPID

A.1.1 Error occurring when the Market Operator does not have a record of the Supply Point in its system. This could occur as a result of either:

(a) an error occurring during the production of the Data Transaction; or

(b) because the Supply Point is not registered with the Market Operator when the Meter Read is received.

A.2 Unrecognised combination of Meter Manufacturer and Manufacturer Meter Serial Number

A.2.1 Error occurring when the Market Operator does not have a record of the meter in the Central Systems. This could occur as a result of either:

(a) an error occurring during the production of the Data Transaction; or

(b) because the meter has not been registered with the Market Operator when the Meter Read is received.

A.3 Invalid Meter Read Type / Meter Read Method

A.3.1 Error occurring when:

(a) the submitted Meter Read is an Initial Read and there is a previous Meter Read for the same meter of any Meter Read Type; or

(b) a Final Read has previously been submitted for the same meter; or

(c) there are no previous Meter Reads for the meter, and the submitted Meter Read is not an Initial Read; or

(d) the combination of Meter Read Type and Meter Read Method is not a valid combination in accordance with CSD 0202 (Meter Read Submission: Process).

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A.4 Meter Read Date invalid

A.4.1 Error occurring when:

(a) the Meter Read Date is later than the date of submission of the Meter Read; or

(b) the Meter Read Date is before the Meter Read Date of a previously submitted Meter Read;

A.4.2 A Meter Read with the same Meter Read Date as a previously submitted Meter Read shall be accepted or rejected depending on the Meter Read Type of the relevant preceding Meter Read and the new Meter Read, in accordance with the table set out below:

		Submitted Meter Read Type (with same Meter Read Date)					
		I	**F**	**X**	**Y**	**C**	**T**
Preceding Meter Read Type	**I**	Reject	Reject	Reject	Reject	Reject	Reject
	F	Reject	Reject	Reject	Reject	Reject	Reject
	X	Reject	Accept	Reject	Accept	Reject	Reject
	Y	Reject	Accept	Accept	Reject	Reject	Reject
	C	Reject	Accept	Accept	Accept	Reject	Accept if from different Retailer
	T	Reject	Accept	Accept	Accept	Reject	Reject

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(a) For the above purposes, in the event that there are more than one preceding Meter Reads with the same Meter Read Date, only the preceding Meter Read with the Meter Settlement Flag value set to True will be used.

(b) Where a Meter Read with the same Meter Read Date as a previously submitted Meter Read is accepted (in accordance with the table above), the Market Operator shall set the Meter Settlement Flag of the relevant previous Meter Read to False, denoting that the previous Meter Read has been superseded by the new Meter Read and shall no longer be used in the Settlement Process.

A.5 SPID not Registered to this Retailer or Wholesaler (as appropriate)

A.5.1 Error occurring when the SPID is not Registered for that Retailer or Wholesaler or Incoming Retailer (as applicable) for the Meter Read Date being submitted. The error may occur because:

(a) Registration data has not been updated upon a Transfer Registration;

(b) the SPID data has been populated incorrectly; or

(c) the SPID has transferred to a new Retailer.

A.5.2 For Transfer Reads, the Sewerage Retailer shall be permitted to submit a Meter Read in respect of the associated Water Meter, even where it is not the Registered Retailer for the associated Water Services Supply Point.

A.6 Combination of Meter Manufacturer and Manufacturer Meter Serial Number not associated with this SPID

A.6.1 Error occurring when the combination of Meter Manufacturer and Manufacturer Meter Serial Number is not associated with that SPID at the Meter Read Date being submitted. The error may occur because:

(a) Registration data has not been updated upon a meter exchange;

(b) the SPID data has been populated incorrectly; or

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(c) the combination of Meter Manufacturer and Manufacturer Meter Serial Number has been incorrectly populated.

A.7 Missing Meter Read value

A.7.1 Error occurring when the Meter Read Submission does not contain a Meter Read value. This Data Item should be populated and a new Meter Read submitted.

A.8 Outside Volume threshold

A.8.1 Error occurring when the Volume in the submitted Meter Read is outwith the expected maximum. This may result from:

(a) a large change in the Volume pattern at the site (which may be correct);

(b) a meter fault having occurred; or

(c) Incorrect population of the Meter Read Volume field.

A.8.2 Where the Meter Read has been confirmed as correct by the Trading Party, the Meter Read can be resubmitted as a Re-Read.

A.9 Outside Nominal Maximum Design Capacity limit

A.9.1 Error occurs when the Nominal Maximum Design Capacity has been exceeded. This may result from either:

(a) a meter fault having occurred requiring resolution; or

(b) Incorrect population of the Meter Read field resulting in erroneous Volume.

A.9.2 Where the Meter Read has been certified as correct, the Meter Read can be resubmitted as a Re-Read.

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B. Appendix: Rollover Detection Algorithm

B.1 Terminology

B.1.1 The following terminology is used:

	Earlier Reads	Earlier Reads	Previous Read	Candidate Read
Reads	R_{-2}	R_{-1}	R_0	R_1
Advances	A_{-2}	A_{-1}	A_0	
Daily Rates of Advance	DRA_{-2}	DRA_{-1}	DRA_0	

B.1.2 The new candidate read R1 shall always exist.

B.1.3 The most recent previous read is R0, and may or may not exist.

B.1.4 If R0 exists, the second most previous read is R-1 and may or may not exist.

B.1.5 If R-1 exists, the third most previous read is R-2 and may or may not exist.

B.1.6 Similarly the advances between the reads A-2, A-1 and A0, may or may not exist. The advance A0 shall be calculated for the purposes of this algorithm on the assumption that a rollover has taken place between the reads is R0 and R1.

B.1.7 Corresponding to the advances A-2, A-1 and A0, the Daily Rates of Advance DRA−2, DRA−1 and DRA0 are calculated taking account of the number of days between the dates of the reads, but taking no account of either vacancy or temporary disconnection.

B.1.8 The number of dial digits on the meter is n.

B.1.9 In the case where another Meter Read has already been accepted with the same Meter Read Date as the Meter Read currently being checked using the Rollover Algorithm, the previously accepted Meter Read shall not be taken into account in establishing R0, R-1 and R-2. R0 must always have an earlier Meter Read Date than the Meter Read being validated.

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B.2 Outline algorithm

B.2.1 The Rollover Detection Algorithm first categorises some Meter Reads as "Indeterminate" based upon the Meter Read Dates.

B.2.2 For those reads which have not been classified as "Indeterminate", the algorithm then carries out the tests for the state: "Not a rollover".

B.2.3 Those reads which have neither been classified as "Indeterminate" nor "Not a Rollover", are then tested for the state "Rollover".

B.2.4 Finally, any reads which have not been classified as "Indeterminate", "Not a Rollover" or "Rollover" are classified as "Indeterminate".

B.3 Indeterminate

B.3.1 Where there is at least one prior Meter Read, and the Meter Read Date of the most recent prior Meter Read is over two years earlier than the Meter Read Date of the current read, then the Market Operator shall classify the current read as "Indeterminate".

B.4 Not a Rollover

B.4.1 For those reads which have not been classified as "Indeterminate", the Market Operator will classify reads as "Not a Rollover" if either of the following two conditions are met.

B.4.2 Either:

(a) R_0 does not exist (ie this is a first read); or

(b) $R_1 – R_0 > - (Q_1 + Q_2 * 10^n)$

where Q_1 and Q_2 are configurable parameters as specified below.

B.5 Rollover

B.5.1 For those reads which have not been classified as either "Indeterminate" or "Not a Rollover", the Market Operator will classify the read as a "Rollover" if the following condition is met

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Rollover = { (Passes Test 1) AND (Passes Test 2) AND (Passes Test 3) AND (Passes Test 4) AND (Passes Test 5) }

B.5.2 These sub tests are defined as follows:

B.5.3 Test 1

(a) R_0 and R_1 exist; and

(b) $R_0 >= V_0 * 10^{n-2}$; and

(c) R_0 is "Not a Rollover"; and

(d) $R_1 < V_1 * 10^{n-2}$.

where V_0 and V_1 are configurable parameters (integers).

B.5.4 Test 2

(a) R_{-1}, R_0 and R_1 exist; and

(b) R_{-1} is Not a Rollover; and

(c) R_0 is Not a Rollover; and

(d) Plow * DRA_{-1} < DRA_0 <Phigh * DRA_{-1}.

where Plow and Phigh are configurable proportions (specified as a decimal with up to two decimal places) – for example 0.2 and 2.0.

B.5.5 In calculating Test 2 it shall be assumed that a Meter Rollover has taken place for the purposes of determining DRA_0. However, this assumption is specific to this Test 2, and shall not affect any other setting or determination of the rollover flag associated with the meter read R_0.

B.5.6 Test 3

(a) R_0 and R_1 exist; and

(b) R_0 is Not a Rollover; and

(c) $10^n + R_1 - R_0 < P_1 * 10^n$.

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where P_1 is a configurable parameter (specified as a decimal with up to two decimal places).

B.5.7 Test 4

(a) R_{-1} and R_0 to exist; and

(b) R_{-1} is "Not a Rollover"; and

(c) R_0 is "Not a Rollover"; and

(d) $R_0 - R_{-1} < P_2 * 10^n$.

where P_2 is a configurable parameter (specified as a decimal with up to two decimal places).

B.5.8 Test 5

(a) R_{-2} and R_{-1} exist; and

(b) R_{-2} is "Not a Rollover"; and

(c) R_{-1} is "Not a Rollover"; and

(d) $(R_{-1} - R_{-2}) < P_3 * 10^n$.

where P3 is a configurable parameter (specified as a decimal with up to two decimal places).

B.6 Indeterminate

B.6.1 The Market Operator shall classify the read as "Indeterminate" if the Meter Read has not been previously classified as either "Indeterminate", "Not a Rollover" or "Rollover" by the previous tests.

B.7 Parameters

B.7.1 The Market Operator shall set the Rollover Detection Algorithm parameters as follows:

Q_1	1000
Q_2	0

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V_0	90
V_1	10
Plow	0.2
Phigh	2.0
P_1	0.1
P_2	0.1
P_3	0.1

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C. Appendix: Nominal Maximum Design Volume

C.1.1 The table below shall be used for the purposes of the Nominal Maximum Design Volume validation check described in Section 2.6 of this CSD.

C.1.2 The Market Operator shall set the initial values for the Nominal Maximum Design Volume table below. Note that the Nominal Maximum Design Volume represents a typical nominal design limit for meters of that physical size. It is possible for more water to physically flow through the meter.

Nominal Maximum Design Capacity		
Lower Physical Meter Size (mm)	**Upper water Physical Meter Size (mm)**	**Nominal Maximum Volume (m^3)**
1	24	17,500
25	29	35,000
30	39	62,000
40	49	96,000
50	79	254,000
80	99	412,000
100	149	622,000
150	199	1,568,000
200	249	2,620,000
250	299	4,200,000
300	≥ 300	2,100,000,000

C.1.3 The Market Operator shall review this table annually, and make a recommendation to the Panel as to whether a Change Proposal should be raised to amend the table.

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D. Appendix: Meter Reads Analysis Report

D.1 Background

D.1.1 Accurate settlement requires the Trading Parties to submit timely and accurate Meter Reads. Whilst the Market Operator facilitates the process of Meter Read submission by carrying out a number of validations on submitted Meter Reads and by setting the Rollover Flag based upon the Rollover Indicator submitted by the Trading Parties, it remains the responsibility of the Trading Parties to ensure that the Meter Reads, including the Rollover Flag, are correct.

D.1.2 To facilitate the process of ensuring that the Meter Read Data is correct, the Market Operator shall produce a Meter Read Report in accordance with CSD 0302 (Standing Reports and Data Extracts) which will identify Meter Reads for examination. The Data Owner shall treat the provision of these Reports as a request by the Market Operator to the Data Owner to investigate the accuracy of the Data under Section 4.2.4 of the Market Terms.

D.1.3 For the avoidance of doubt, if a Meter Read appears in the Reports, it may or may not be incorrect; nor does the absence of a Meter Read from the Reports confirm its correctness.

D.1.4 The Market Operator shall review the Meter Read Reports at the same time as it reviews the Rollover Detection Algorithm.

D.2 Frequency of Reporting

D.2.1 A Meter Read shall appear in the Report once for each test failure. The tests are detailed in section D.3 below. In respect of each test failure, a Meter Read will appear in up to two separate Reports.

D.2.2 The test failure will be reported the first time it is identified; and if it continues to exist, it will be reported for a second time in the Report which is next undertaken following the next submission of a Meter Read for the applicable meter. The submission of a further read will provide more context for the test failure.

D.2.3 If a Meter Read is amended by a Retrospective Amendment, but continues to fail one of the tests detailed in section D.3 below, then the Report of the test failure shall be deemed to be the first such Report.

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D.3 Detailed Test Criteria

Test 1: Rollover Discrepancy

D.3.1 The Market Operator shall report a rollover discrepancy if either:

(a) The Meter Read has the Rollover Flag set to True and if the Rollover Detection Algorithm described in section D.2 were to be run, it would return the result "Not a Rollover" for the Meter Read; or

(b) The Meter Read has the Rollover Flag set to False and if the Rollover Detection Algorithm were to be run, it would not return the result "Not a Rollover".

Test 2: Meter Advance Discrepancy

D.3.2 The Market Operator shall report a meter advance discrepancy if the rate of meter advance between a Meter Read and the previous Meter Read is greater than 1.2 times the maximum rate of advance envisaged by the table Nominal Maximum Design Volume. In calculating the rate of advance for the meter, where the meter is not a Non-Market Meter, the Market Operator shall take account of the occupancy of the Eligible Premises to which the meter is registered.

Test 3: Dial Digits Discrepancy

D.3.3 The Market Operator shall report a dial digits discrepancy where the Meter Reads suggest that there is a different number of dial digits compared to the number Registered for the meter, if either:

(a) the Meter Read has the Rollover Flag set to True and the maximum value of any Meter Read in the set of Meter Reads for that meter is less than 10% of the maximum permissible value for that meter, given the number of digits on the meter read dial; or

(b) both of the following conditions are true:

(i) $R_0 - R_{-1} > 1000$; and

(ii) $(R_0 - R_{-1}) < 0.1 * 10^n$, where *n* is the number of dial digits.

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Change History

Version Number	Date of Issue	Reason For Change	Change Control Reference	Sections Affected
Draft 20141107	07 Nov 2014	For industry workshops 12/13 Nov 2014		
Draft 20141211	11 Dec 2014	For industry consultation		
20150511	11 May 2015	For industry consultation		
20150714	14 July 2015	For pre-vendor MAP		
ICP Housekeeping Version	25 August 2015	Non -material housekeeping changes	ICP/WRC/CP001	All
ICP Algebra	22 September 2015	Settlement Quality Assurance	ICP/WRC008	Section 2.1, Section 2.6, Appendix B, Appendix D
ICP Quality Assurance	22 September 2015	Clarificatory and syntax changes following review of the texts	ICP/WRC009	2.3 (process diagram); 2.4 (table); A4.2; and all references to Appendix 1, 2 or 3
20150930	30 September 2015	For post-vendor MAP		As per Algebra and Quality Assurance versions
ICP Housekeeping	21 September 2016	Changes to reflect ICP Change Proposal ICP/WRC049	ICP/WRC049	B.1.6; C.1.2
20160921	21 September 2016	For 20160921		As per ICP/WRC049