MARKET PROCESS DESIGN

MPD 14 - Market Process for Reading Processing for Non Interval

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1. Introduction

1.1 Scope

This Procedure describes the requirements for the data processing for Non Interval meter readings

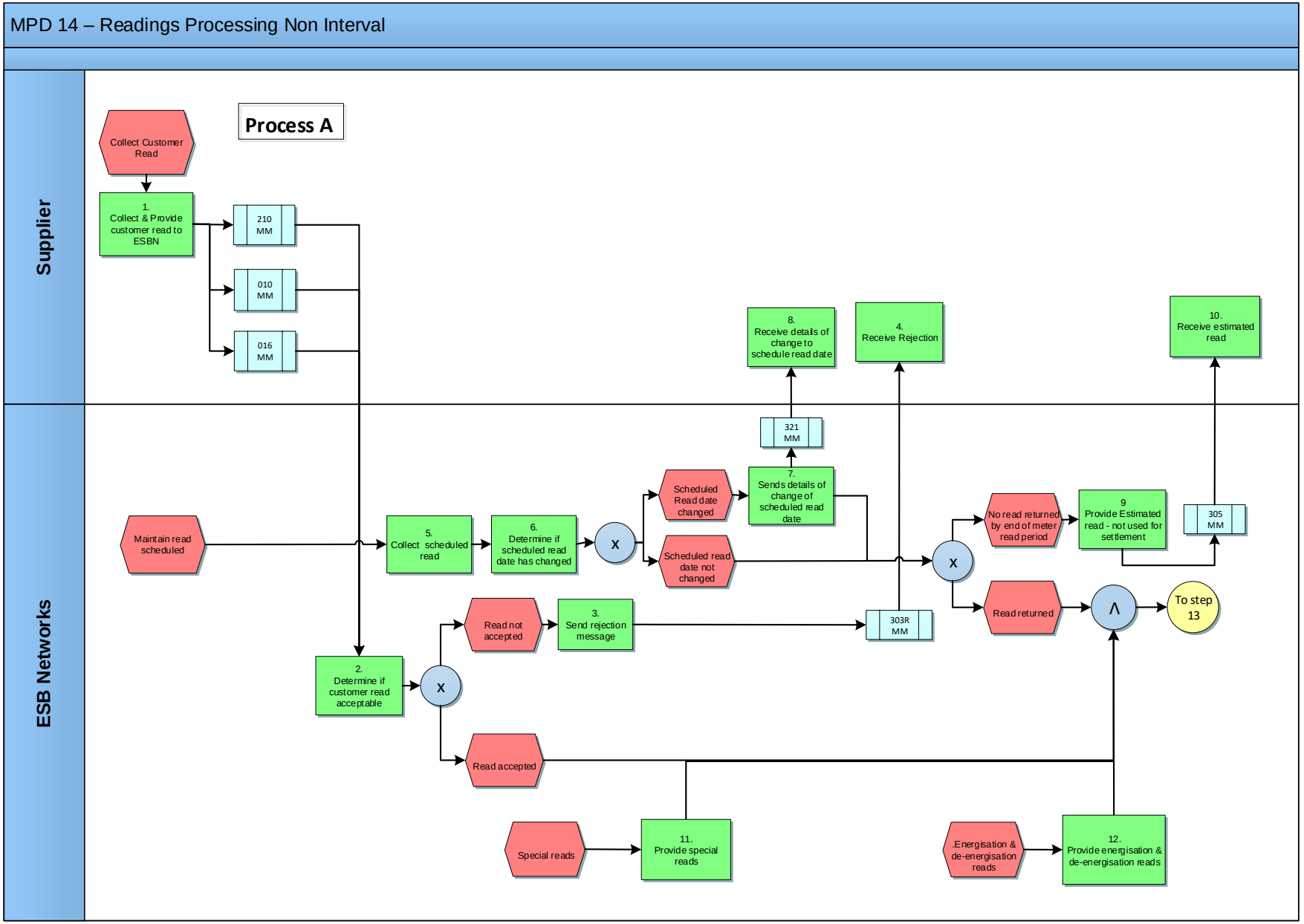
1.2 History of Changes

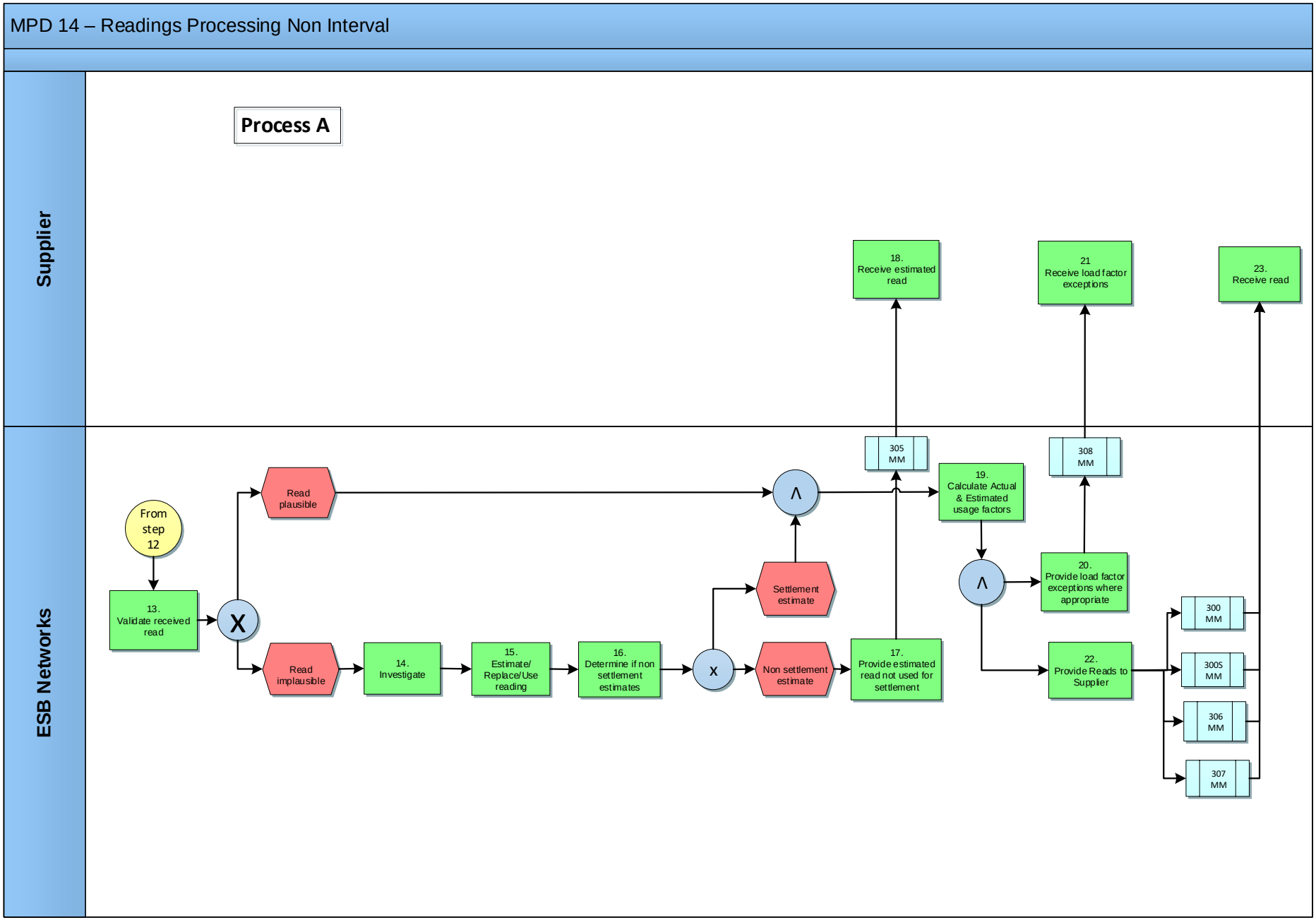
This Procedure includes the following changes:

Version in which last change Implemented	Source of Change	Description of Change
Draft	B093	Identification of (withdrawn) meter readings
Draft	B096	Implausible reads
Draft	B098	Changes to estimation and validation rules
Draft	B105	Changes to aggregation approach incorporating re-aggregation and usage factors
Draft	B166	Changes to the application of usage factors
Draft	B168	Customer Own Read Read date
Draft	B117	Changes to readings processing for CoLE
Draft	B157	Usage Factors for incomplete reads
Draft	B200	Updated to handle situations where the estimate used for a COS is greater than the next actual read
Draft	B204/Written Supplier Clarification 10	Updated section 3.4 to clarify that a customer read received whilst a Scheduled Meter Read Order is open will be used for DUoS Billing
		Change applied since Version 4.0 DRAFT
Version 4.1		Updated text to indicate that manual intervention between MRSO and the Supplier may occur prior to customer read rejection
Version 4.3	DRR 0013	(Section 3.11) Removed ; 'For Meter Points with MIC greater than 30 kVA the Supplier will be informed, with the reason, in advance.'
Version 4.3	DRR 0021	Changes to Process Map and text to highlight cases where estimates will be sent on 305
Version 4.4	DRR 0037	Update text to reflect clarification to where there is a change in Load factor or DUoS Group
Version 4.4	DRR 0052	Amendments to Section 3.11 to include 305 as a valid message upon which to issue a replacement reading
Version 8.0	RMDS QA	MPD clean-up: objects enlarged to make text readable, swimlane actors shifted left, swimlanes tightened.
Version 8.0	MCR 0163	Tolerance levels for NQH Meter Reading Validation added to Supplementary Information for MPD 14
Version 10.3	MCR 1145 – Conversion of MPDs	ARIS Process flow converted to Visio format and Step Table included. Changes to process flow for logical sequencing - MPD separated into Process A, B, C

Version in which last change Implemented	Source of Change	Description of Change
	from ARIS to document format. MCR086 - Text To be added to MPD14 to cater for Standard Profile Changes	It was identified that MCR086 was not implemented when approved. Updated Supplementary Information to include this MCR.
Version 10.3 SMART 1.0	NSMP - ESBN Workstream workshops	Submitted as DR v1.0 (and MCR v2.0) for ReMCoWG 17.06.2015
Version 10.5	MCR 1149 – Request that Suppliers ensure that they submit only one active COLE 016MM for an MPRN	Supplementary Information updated with details requesting that Suppliers ensure they submit only one active COLE 016MM for an MPRN.
Version 13.0	MCR 1157	Changes made in the MPD to update 'NQH' to 'Non Interval' in sections 1.1 and 2 Process Step and Process Step Description updated
Version 13.2	Non-Conformance	"Visit site and" removed from the beginning of the Process Step 5.

2. Process Map




MPD 14 – Readings Processing Non Interval
Supplier
ESB Networks
Process A
From step 12
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Read plausible
Read implausible
14. Investigate
15. Estimate/ Replace/Use reading
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Λ
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Λ
20. Provide load factor exceptions where appropriate
21 Receive load factor exceptions
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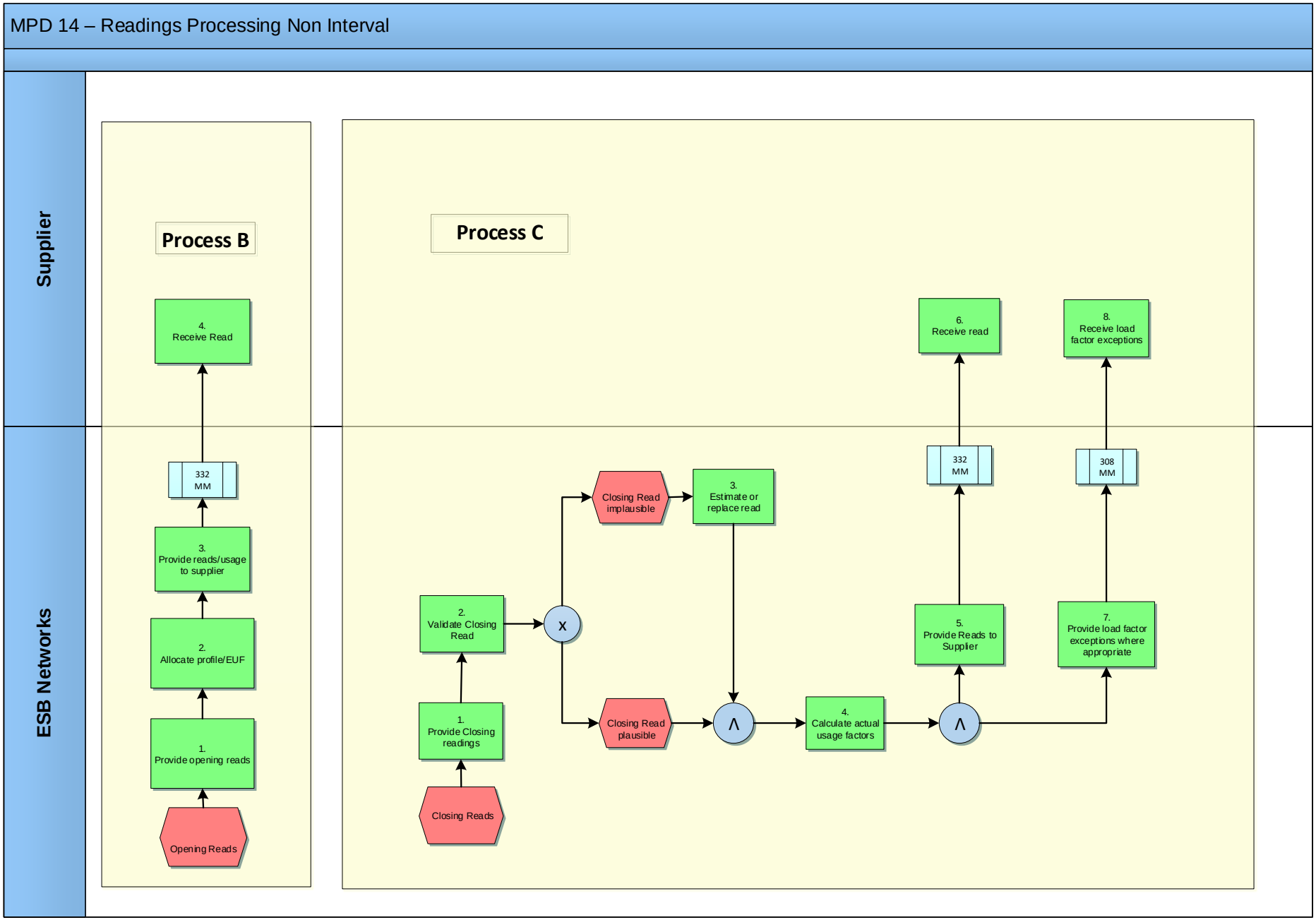
MPD 14 – Readings Processing Non Interval
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Process B
Process C
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MM
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Provide reads/usage
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Allocate profile/EUF
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Provide opening reads
Opening Reads
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Validate Closing
Read
X
Closing Read
implausible
3.
Estimate or
replace read
1.
Provide Closing
readings
Closing Reads
Closing Read
plausible
Λ
4.
Calculate actual
usage factors
Λ
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Receive read
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MM
5.
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Supplier
8.
Receive load
factor exceptions
308
MM
7.
Provide load factor
exceptions where
appropriate

2.1 Process Description - Process A

Process Step		Role	Process Step Description	Interface
1	Collect and provide customer read to ESBN	Supplier	A Supplier may provide readings (determined by the Supplier or obtained from the customer) for any meter point except maximum demand sites or remotely read sites where a read has been obtained.	210 MM 010 MM 016 MM
2	Determine if customer read acceptable	ESBN	ESBN will determine if the readings received are acceptable - see Section **3.4 - Treatment of Supplier and Customer readings** • Readings acceptable **- next step 10** • Readings unacceptable **- next step 3**	
3	Send rejection message	ESBN	Supplier is advised that customer reading is rejected, the market message will include the rejection reason	303R MM
4	Receive rejection message	Supplier	Supplier receives the rejection message	
5	Collect Scheduled Read	ESBN	Suppliers will be advised of the read schedule for each meter point. Where there is a permanent change to the read schedule date the Supplier will be advised (321 MM). Where the meter can be read remotely, a remote reading will be taken. Where the Comms are not feasible and the meter cannot be read remotely, ESBN will visit the site and collect the scheduled readings: • Reading collected **- next step 10** • Reading not collected **-next step 6**	
6	Provide estimate read – not used for settlement	ESBN	Where no read is obtained by the end of the read scheduled date, ESBN will provide estimate readings for each meter point as at the planned read date together with consumption for all registers where no reading was obtained and the no read reason. Usage factors are not calculated in these circumstances. These estimates will not be used for settlement.	305 MM
7	Receive estimated reading	Supplier	Supplier receives estimated readings	
8	Provide Special Reads	ESBN	Where the meter can be read remotely, a remote reading will be taken. Where the meter	

Process Step		Role	Process Step Description	Interface
			cannot be read remotely, ESBN will collect and provide special reads to MRSO. ESBN will take all reasonable measures to ensure that MRSO can accept the readings and is responsible for investigating and resolving the causes of any rejection. Special readings obtained by ESBN will be validated **- next step 10**	
9	Provide energisation & de-energisation readings	ESBN	ESBN will collect and provide readings relating to energisation and de-energisation to MRSO. ESBN will take all reasonable measures to ensure that MRSO can accept the readings and is responsible for investigating and resolving the causes of any rejection. Readings obtained at energisation or de-energisation of a meter point will be validated **- next step 10**	
10	Validate received readings	ESBN	ESBN will validate customer, special, scheduled, energisation and de-energisation readings according to the agreed rules - see section **3.5 – Validation of Readings**. • Readings plausible **- next step 16** • Readings implausible **- next step 11**	
11	Investigate	ESBN	Where readings are deemed implausible ESBN will review the readings and take appropriate action - see section **3.6 - Implausible Reads**	
12	Estimate/Replace/Use reading	ESBN	Readings which are originally determined to be implausible maybe set to plausible, or replaced with an estimated reading.	
13	Determine if non settlement estimates	ESBN	Where a full set of plausible readings has not been obtained ESBN will determine if the estimates generated are to be used for settlement. Estimates will generally not be used for settlement where: • A full set of estimates have been generated and • the estimates are not used for final billing purposes A mixture of actual readings and estimates maybe used for settlement. • Settlement estimate **- next step 16** • Non settlement estimate **- next step 14**	
14	Provide estimated read not used for settlement	ESBN	Non settlement estimates are provided to the Supplier	305 MM
15	Receive estimated reading	Supplier	Supplier receives estimate readings	
16	Calculate actual and	ESBN	Where plausible readings are obtained ESBN will calculate the actual usage factors (AUF*)	

Process Step		Role	Process Step Description	Interface
	estimated usage factors		and estimated usage factors (EUF*) for use in Aggregation - see section **3.8 - Usage Factor Calculation** *AUF - the kWh consumption in a read period extrapolated to an annual figure based on the demand profile applied to the meter point *EUF – a statement of expected consumption in kWh for the next year	
17	Provide Load Factor exceptions where appropriate	ESBN	Provide the Supplier with Load Factor Exceptions	308 MM
18	Receive Load Factor exceptions	Supplier	The Supplier receives details of Load Factor exceptions	
19	Provide reads to Supplier	ESBN	Provide to the Supplier all plausible readings that were obtained together with consumption	300 MM 300S MM 306 MM 307 MM
20	Receive reads	Supplier	Supplier will receive readings	

2.1 Process Description - Process B

Process Step		Role	Process Step Description	Interface
1	Provide opening readings	ESBN	ESBN provides opening readings. For remotely read meters, the opening reads will always be the start of day readings.	
2	Allocate Profile/EUF	ESBN	Where opening readings are obtained ESBN will allocate Load Profiles and the default EUF	
3	Provide readings/Usage Factors	ESBN	ESBN will provide the opening readings together with the Load Profile and EUF data allocated in accordance with agreed rules - see section 3.9 **- Initial Allocation of Profiles and Estimated Usage Factors**	332 MM
4	Receive readings	Supplier	Supplier receives initial readings, Load Profiles and EUF data	

2.1 Process Description - Process C

Process Step		Role	Process Step Description	Interface
1	Provide closing readings	ESBN	ESBN provides closing readings.	
2	Validate closing readings	ESBN	ESBN will validate closing readings according to the agreed rules - see section **3.5 - Validation of Readings.** • Reading implausible **- next step 3** • Reading plausible **- next step 4**	
3	Estimate / replace reading	ESBN	When a reading is determined to be implausible ESBN will review the reading and take the appropriate action to determine a plausible reading - see section **3.6 - Implausible Reads**	
4	Calculate usage factors	ESBN	ESBN will calculate the Actual Usage Factors (AUF) for use in Aggregation - see section **3.8 - Usage Factor Calculation**	
5	Provide closing readings	ESBN	Following validation and calculation of Usage Factors, ESBN will provide to the Supplier all the closing readings that were obtained together with consumption. The calculated AUF will also be provided.	332 MM
6	Receive readings	Supplier	The Supplier will receive the readings	
7	Provide Load Factor exception where appropriate	ESBN	Subject to installation of the appropriate metering, ESBN will also report to the Supplier on Load Factor exceptions - see section **3.12 –Load Factor Exceptions**. Based on the new Load Factor, ESBN may change the Profile associated with the Meter Point.	308 MM
8	Receive Load Factor exception	Supplier	The Supplier receives details of Load Factor exceptions	

3. Supplementary Information

3.1 Calculating Estimates and Expected Advances – Consumption and Wattless

An estimated reading will be calculated as the last plausible actual, customer or estimated reading plus the expected advance since that reading.

The expected advance will be determined as:

$$\text{Base advance} \times \frac{\text{Profiled weight}[1] \text{ of expected advance period}}{\text{Profiled weight of base advance period}}$$

The base advance will be the advance in an equivalent actual read period in the previous year provided that this period is representative. If a previous year advance is not available the base advance will be the advance in the immediate preceding read period provided that this period is representative.

Where neither previous year nor preceding period advances are available then the base advance will be the annual Period Consumption assigned by DSO for the register. In this case the profiled weight of the base advance period is 1.

3.2 Calculating Estimates and Expected Advances – Maximum Demand

The expected demand will be determined as the maximum demand in the previous read period.

If previous meter readings are not available then the expected demand will be the Period Demand assigned by DSO for the register.

For accumulating registers the expected advance is the expected demand adjusted for any multipliers.

3.3 Site Checks

The Data Collector will report on the following:

[1] The profiled weight of an advance period is the sum of the daily weighting coefficients assigned to the register from period start to the period end date, inclusive. Over a period of one year the sum of daily weighting coefficients is 100%. Profiled weights will be maintained in line with, but may not be identical to, DSO provided Derived Load Profiles as used in aggregation.

- Stopped, damaged or otherwise faulty meters
- Evidence of tampering or the taking of supply on a de-energised meter
- Wrongly functioning time-switch or clock
- Occupation of a vacant premise

As a result of these reports the Data Collector will initiate any relevant investigations.

The Data Collector will re-verify:

- Advances that are negative based on the previous plausible reading
- Advances that are more 200% of the expected advance or demand

3.4 Treatment of Supplier and Customer Readings

Customer and Supplier readings will be processed for DUoS billing and for Settlement where they meet any of the following criteria:

- Provided for the purposes of a Change of Supplier by a Supplier that has provided an accepted registration
- Provided for the purposes of a Change of Legal Entity
- Provided where a Meter Reading Order is open (the period two days before and up to a maximum of seven days after the scheduled read date where an actual reading has not yet been collected). This period will be shorter where an planned or unplanned estimate is to be made. Any actual read collected as a result of the Meter Read Order but subsequent to the customer read will not become available to be processed.
- Provided to correct a billing over-estimate (i.e. the reading is less than the estimate)

Any other Customer and Supplier readings will be processed for Settlement only.

Readings will be rejected, however, in the following circumstances:

- If a reading is received from a Supplier that is not the registered Supplier, unless for the purpose of a Change of Supplier
- If a reading is received for a Maximum Demand Meter Point.
- If a Change of Supplier reading is provided with a date more than three days prior to the date that DSO receive the read
- If a Change of Legal Entity reading is provided with a date on or prior to the date of the last DuoS bill; unless the MIC is greater than 30 kVA
- If a customer reading, other than Change of Supplier and Change of Legal Entity, is provided with a date on or before the date of the last DUoS bill..
- If the meter id / meter register number or timeslot detail provided with the reading cannot be matched to an installed meter register for the MPRN at the effective read date.
- If the meter can be read remotely, a reading provided on the messages 210(without a read reason 26) will be rejected.
- If the meter can be read remotely, a reading provided on the messages 210(with a read reason 26) will be rejected if there is no CoS in progress.
- If the meter can be read remotely and a remote reading has been obtained, a reading provided on the messages 210(with a read reason 26),010 or 016 will be rejected.

- If the meter can be read remotely and a remote reading has not been obtained, a reading provided on the messages 210(with a read reason 26),010 or 016 will be accepted and used if it's valid, otherwise the reading will be rejected.
- If a reading provided on the messages 210, 010 and 016 for a Half Hourly or QH site, it will be rejected.

Only one active COLE 016MM for an MPRN should be submitted at any one time.

This means that once an 016MM for an MPRN is submitted the supplier should ensure no further 016MM is submitted for that same MPRN and for the same "Effective from Date" that appears on the 116MM until either a 116MM (see MPD25) and its associated 300MM (see MPD14), or else a 116R (see MPD 25) has been received.

The exceptions to this are as follows:-

 Where the supplier has already submitted a valid future dated 016MM, in which case the existing market rules remain in place.

 Where a Landlord/Tenant CoLE is taking place Suppliers may be required to send multiple 016MMs in quick succession for the same MPRN

3.5 Validation of Readings

3.5.1 Consumption and Wattless Registers

Meter advances are calculated from the date of the previous plausible actual, customer or estimated reading. Where a negative advance has been detected then validation will be performed as if a clock-over had occurred. Estimated readings providing a negative advance are ignored.

Consumption and Wattless readings will be deemed as implausible if any of the following occur:

- A meter advance is more than 200% of the expected advance
- A meter advance occurs during a period of de-energisation

Consumption is calculated from the last actual, customer or estimated meter reading and is expressed in kWh after allowing for multipliers and clockovers.

3.5.2 Maximum Demand Registers

For accumulating registers the maximum demand is the meter advance adjusted for any multipliers.

Maximum Demand readings will be deemed as implausible if any of the following occur:

- An advance in a Maximum Demand Reset Counter is not 1.
- A maximum demand is more than 200% of the expected demand
- An advance occurs during a period of de-energisation
- A negative maximum demand appears to have occurred

3.5.3 Tolerance levels for Non Interval ~~QH~~ Meter Reading Validation

Current Tolerance Levels				
Expected Consumption on Register (kWh/kVArh)		**Absolute Tolerance (kWh/kVArh)**	**Relative % Tolerance**	**Resulting consumption range for plausibility (kWh/kVArh)**
0	199	1000		Expected Consumption +1000
200	499		250	700 to 1750
500	799		200	1500 to 2400
> or = 800			100	1600 to ∞

Example 1. Band 1. If the expected consumption is 177 kWh (in the 0 to 199 kWh range), and the calculated consumption is 1200 kWh, the expected consumption is added to the absolute value i.e. 177 + 1000 = 1177. Reading 1200 is therefore outsorted as an implausible meter reading as it is greater than 1177, which is the highest reading permitted.

Example 2. Band 2. The range of consumptions which can be released for this band is 700 to 1750 and can be calculated as follows:

Expected Consumption 200: **200+(250%*200) = 200+(2.5*200)=200+500 = 700**
Expected Consumption 499: **499+(250%*499) = 499+(2.5*499)=499+1247 = 1747**

Example 3. Band 3. The range of consumptions which can be released for this band is 1500 to 2400 and can be calculated as follows:

Expected Consumption 500: **500+(200%*500) = 500+(2*500)=500+1000 = 1500**
Expected Consumption 799: **799+(200%*799) = 799+(2*799)=799+1598 = 2397**

Example 4. Band 4. The range of consumptions which can be released for this band is 1600 and greater, and can be calculated as follows:

Expected Consumption 800: **800+(100%*800) = 800+800 = 1600**

3.6 Implausible Reads

Where a reading is originally determined to be implausible MRSO will review the reading and take appropriate action:

- The reading may be set to plausible where previous reading history or evidence from the supplier, customer, meter operator or data collector suggests that the reading is likely to be correct
- The reading may be replaced by an estimate, calculated as in section 3.1, that will be sent to the Supplier . Automated estimation will not take place if the previous reading was a Change of Supplier reading.
- A previous reading or estimate may be withdrawn and replaced in order that the current reading may be plausible. Where the previous reading or estimate was used for a Change of Supplier, then both Suppliers will be informed before any change is made and the change will be effected as per the disputed readings procedure outlined in MPD1.
- MRSO may instigate a meter problem investigation

DSO will retain a copy of the implausible reading. This will be available to Suppliers on request

3.7 Use of Estimates for Usage Factor Calculation

An estimate will be regarded as a plausible reading for the purpose of usage factor calculation where:

- The estimate is calculated to determine a Change of Supplier closing reading.
- The estimate is calculated to determine a Change of Legal Entity closing reading.
- The estimate is calculated to determine a meter works closing or de-energisation reading.
- The estimate replaces an implausible reading and other plausible readings were obtained.

3.8 Usage Factor Calculation

When plausible readings (including estimates for closing reads where plausible actual reads are not available) are obtained for any consumption register at a Meter Point and these are not all opening reads then Actual Usage Factors will be calculated for each Timeslot. These values shall be expressed in kWh and used in Data Aggregation.

An Actual Usage Factor (AUF) is calculated for the Timeslot for the read period terminated by the reading as follows:

AUF = Sum for all registers associated with the Timeslot of the kWh consumption divided by the Profiled Proportion of Year [2] of the period of consumption

For each meter reading period a new estimated usage factor (EUF) is calculated for the Timeslot by the following method:

Re-calculated EUF = The average of AUF, weighted according to the length of the read period, over the previous year.

Estimated usage factors shall not be aggregated in respect of Timeslots for which all meter registers are removed.

Estimated usage factors shall not be aggregated in respect of Meter Points that are de-energised.

[2] The Profiled Proportion of Year is the sum of the profile coefficients, determined from the derived load profiles, assigned to the Timeslot from the read period start to the read period end date, inclusive. Over a period of a 365-day year the sum of coefficients is 1.

3.9 Initial Allocation of Profiles and Estimated Usage Factors

For each Timeslot where one or more meter registers record consumption to be settled a Derived Load Profile and an EUF will be initially allocated on installation in accordance with published rules for the combination of:

- For non-MD sites, whether the meter point is rural domestic, urban domestic or non-domestic, as determined by the DUoS Group
- For MD sites, the load factor
- The Timeslot

Wherever there is a change in the meter configuration then a new Derived Load Profile and EUF will be automatically allocated in accordance with the published rules

Whenever there is a change in the load factor or DUoS group then a new Derived Load Profile will be allocated in accordance with published rules and a new default EUF assigned based on the new DUoS Group or load profile.

3.10 Read Date Management

Each reading and usage factor will be associated with a read date and time. These are managed as follows:

	Deemed Read Date/Time	**Start of Read Period Actual and Estimated Usage Factor**	**End of Read Period Actual Usage Factor**
Customer, Special or Scheduled Read	23h59 on Read Date	Day following Read Date	23h59 on Read Date
New Meter Opening Read	00h00 on Install Date	Install Date	Not applicable
Removed Meter Closing Read (Meter not Exchanged)	23h59 on Removal Date	Not applicable	23h59 on Removal Date
Smart Meter reconfiguration from Non Interval to Half Hourly Removed Meter Closing Read (Meter not Exchanged)	**Actual** 23h59 End of Day read on Reconfiguration Date - 1 (Note: The effective date of MM332 will be the Reconfiguration Date)	Not applicable	23h59 on Reconfiguration Date - 1
Smart Meter reconfiguration from Half Hourly to Non Interval Installed Meter Opening Read (Meter not Exchanged)	00h00 on Install Date	Install Date	Not applicable
Removed Meter Closing Read (Meter Exchanged)	23h59 on day before Exchange Date	Not applicable	23h59 on day before Exchange Date
Energisation Read	00h00 on Energisation	Energisation Date	23h59 on day before Energisation

	Date		Date (Consumption expected to be zero)
De-Energisation Read	23h59 on De-Energisation Date	Day following Energisation Date EUF is not used until Re-Energisation	23h59 on De-Energisation Date

3.11 Readings Reversal

MRSO will have the ability to reverse and, optionally, replace a reading at any point.

In general, readings will only be reversed and replaced if:

- A reading is successfully disputed; or
- A subsequent event proves a reading is wrong; or
- Suppliers agree that a Change of Supplier reading is to be replaced.

Readings will be reversed but not replaced if they are applied to the wrong meter point, meter, register or date. A reading reversal will be communicated to a supplier, without replacement, if a reading was previously sent but the Supplier does not have a registration at the read date.

When a reading is reversed this will be confirmed to the Supplier using messages 300W, 306W, 307W, 310W, 320W or 332W as appropriate to the data being reversed. Any resultant changes to aggregated usage will be calculated and passed to SEMO as part of the re-aggregation process.

When a reading is replaced this will be confirmed to the Supplier using a new message 300, 300S, 305, 306, 307, 310, 320 or 332 as appropriate.

3.12 Load Factor Exceptions

A load factor exception occurs if there is a consistent change to load factors in two consecutive reads. The load factor is calculated as the total annual consumption[3] divided by (maximum demand * consumption hours). The maximum demand figure used is the average in the last twelve months, discounting the highest and lowest figure.

[3] Measured using the valid readings closest to one year prior to the current read. Consumption hours will be 8760 if this equates to 365 days.

A load factor exception does not render a meter reading implausible.

3.13 Standard Profile Changes

Whenever any standard profile change occurs that is not concurrent with the billing of a settlement relevant reading, then the first settlement relevant reading following the change will give rise to two AUFs, each of which is calculated pro-rata according to the load profile applying before and after the effective date of change.