Gas Networks Ireland

FAR Procedures

Forecasting, Allocation, Reconciliation

CRU Approved

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Contents

Glossary of Terms

The definitions presented in the Glossary of Terms below are provided solely for ease of understanding and shall have no legal effect. These definitions are not intended to supplant existing or future definitions contained in the Code of Operations to which the within Procedures relate.

Actual top down NDM demand is a term used to describe the actual NDM demand through all City Gate meters. This is calculated by subtracting LDM demand, DM demand and shrinkage from the total actual metered demand.

Adjusted Weighted Degree-Days (AWDD): the weighted degree day value adjusted to take account of all variations in demand (e.g. weekend/weekday). It is calculated by back solving the WDD- Demand relationship. AWDD is used in the apportionment of the total NDM forecast or in the Allocation of the total NDM demand among Gas Points, further described in Ancillary Procedure 2 (Page 23).

Bottom up estimated NDM demand: the total estimation of demand for each NDM Gas Point. A scaling factor is applied to this bottom up estimated NDM demand figure to ensure that it is equal to the actual top down NDM demand figure.

Consuming NDM Gas Point: an NDM Gas Point which has a meter fitted, at which an End User is assigned, and the relevant meter is not credit or service locked (safety locked sites are allocated to as of 1 July 2015).

Daily allocation scaling factor: a factor, typically close to one, which is applied to the relevant bottom up estimated NDM demand so that in total it matches the forecasted top down NDM demand (before or during the Day), and the actual top down NDM demand (after the Day). The daily allocation scaling factor is the ratio of either the forecasted or actual top down NDM demand divided by the bottom up estimated NDM demand.

Estimated NDM Meter Read: please refer to the MDS Estimation Procedure.

Forecasted top down NDM demand: the forecasted NDM demand as metered at the City Gate.

Load factor: the ratio of the average daily demand (AQ / 365) to the peak load. The average domestic load factor is used to calculate the Supply Point Capacity for NDM Supply Points.

Peak Day: the design condition under which total gas demand is at a maximum. The Irish Transmission System is designed to meet a 2% or '1 in 50' requirement. The Peak Day's demand has a 2% probability of occurring and, as such, would be expected to be exceeded only once in 50 years.

Peak load: the estimate of demand at a Gas Point on the Peak Day. Calculated from the WDD-demand relationship for the Gas Point applying the degree-day value corresponding to the design peak condition.

Premises: an identified location to which gas off-taken at a Supply Point may be supplied.

Weighted Degree-Day (WDD): a measure of one day's temperature used in the regression analysis of demand. The WDD for a Day is calculated from a 50:50 weighted average of the degree-day value for the day and the average degree-day for that particular day of the year over the most recent 30 Gas Years.

1 FARP-01 Top Down Forecasting of NDM Demand

1.1 Purpose / Scope

This procedure relates to and should be read in conjunction with Part D, Section 1 of the Code of Operations. This procedure governs the calculation of the total forecasted top down NDM demand. Such forecasts shall be used in the NDM Forecasting Procedure (FARP-02) which supports the generation of NDM Nomination Advices in accordance with Part D, Section 1 of the Code.

1.2 Related Documents

- FARP-02 NDM Forecasting Procedure
- Code of Operations - Part D, Section 1 (*Nominations and Renominations*)

1.3 Procedure

1.3.1 The procedure will be first applied in respect of Day D at approximately 09:00 on D-1 in order to provide the required input to the NDM Forecasting Procedure (FARP-02), which supports the generation of NDM Nomination Advices. The procedure will also be applied during Day D in order to support the generation of NDM Renomination Advices.

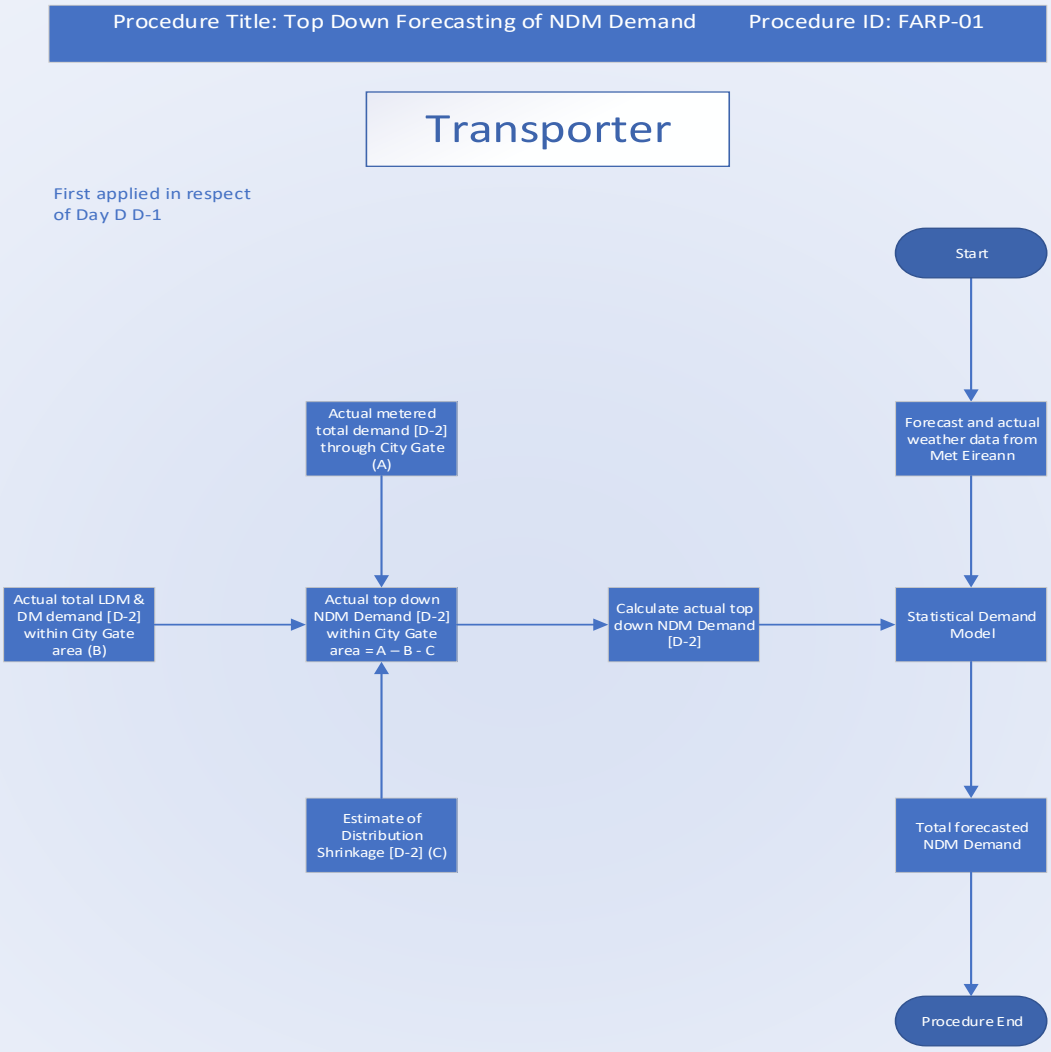
1.3.2 On Day D-1, prior to 09:00, the Transporter shall procure from Met Éireann (or other weather data provider retained for the purpose by the Transporter) forecast weather data for Days D-1 and D, and actual weather data for Day D-2.

1.3.3 The Transporter shall determine a total forecasted top down NDM demand for Day D using a statistical demand model based on recent total actual top down NDM demand and actual weather data up to Day D-2, and the weather forecasts for Days D-1 and D. Such forecasts may be varied by the Transporter to allow for unusual events or circumstances.

1.3.4 Any adjustments to the forecasted top down NDM demand shall be used to generate NDM Renomination Advices, further described in section 2.3.9. below and pursuant to Part D, Section 1 of the Code.

1.4 Procedure Diagram

A diagrammatic representation of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 1.4 and section 1.3, the provisions of section 1.3 shall prevail.


Procedure Title: Top Down Forecasting of NDM Demand
Procedure ID: FARP-01
Transporter
First applied in respect of Day D D-1
Start
Actual metered total demand [D-2] through City Gate (A)
Forecast and actual weather data from Met Eireann
Actual total LDM & DM demand [D-2] within City Gate area (B)
Actual top down NDM Demand [D-2] within City Gate area = A – B - C
Calculate actual top down NDM Demand [D-2]
Statistical Demand Model
Estimate of Distribution Shrinkage [D-2] (C)
Total forecasted NDM Demand
Procedure End

2 FARP-02 NDM Forecasting Procedure

2.1 Purpose / Scope

This Procedure relates to and is to be read in conjunction with Part D, Section 1 of the Code of Operations. The Transporter shall issue NDM Nominations Advices to each Shipper registered as holding NDM Exit Capacity in accordance with Part D, Section 1.7 of the Code. Such NDM Nomination Advices will be based on the apportionment of the forecasted top down NDM demand. This Procedure governs the process for the apportionment of forecasted top down NDM demand between Shippers.

2.2 Related Documentation:

- Code of Operations - Part D, Section 1 (*Nominations and Renominations*)

2.3 Procedure

2.3.1 NDM forecast apportionment is the term used to describe the NDM apportionment process carried out before Day D (D-1), and also on Day D when a Renomination occurs. The timings of the NDM Nominations and NDM Renominations are set out in the Code.

2.3.2 NDM forecast apportionment shall apply to all consuming NDM Gas Point(s) within NDM Supply Points. The process shall be applied daily, it will be first applied in respect of Day D by 09:00 hours on Day D-1. The output of the NDM forecast apportionment process will be a forecast of each Shipper's NDM demand for Day D.

2.3.3 The Transporter shall determine an initial forecast of a Shipper's NDM demand for Day D in respect of its Residential and/or Industrial & Commercial (I&C) portfolios by applying the following formula separately to each of the Shipper's Residential and/or I&C portfolios:

$$\text{Demand forecast} = A_{SUM} + B_{SUM} * AWDD_{FC}$$

Where:

A_{SUM} and B_{SUM} = the summed values of Gas Point A and B parameters for all Residential or I&C (as the case may be) Gas Points in the Shipper's relevant portfolio as at the end of Day D-1; and

$AWDD_{FC}$ = the forecast AWDD for Day D as calculated in the manner described in Ancillary Procedure 2.

2.3.4 For the purposes of this NDM Forecasting Procedure and the NDM Allocation Procedure (FARP-02) a Shipper's residential portfolio shall be defined as a set of NDM Gas Points comprised within those NDM Supply Points at which the Shipper is the Registered Shipper that have been assigned a residential Tariff; and a Shipper's Industrial and Commercial portfolio shall be defined as a set of

NDM Gas Points comprised within those NDM Supply Points at which the Shipper is the Registered Shipper that have been assigned an Industrial and Commercial Tariff, at that time.

2.3.5 The initial forecast of bottom up estimated NDM demand will be revised by applying a day of week adjustment factor. In the case of public holidays, the day of week adjustment factor for weekends will be applied. This adjustment factor will be achieved by applying multiplication factors to the initial forecasts for a Shipper's Residential and/or I&C portfolios, as follows:

Adjusted demand forecast = Initial demand forecast * day of week factor

The day of week factors to be applied to a Shipper's Residential and/or I&C portfolios will be those determined by the Transporter and approved by the Commission from time to time. The following are the day of week factors for the gas year.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Res	0.9567	0.9567	0.9567	0.9567	0.9567	1.0962	1.0962
I&C	1.0934	1.0934	1.0934	1.0934	1.0934	0.7925	0.7925

2.3.6 The adjustment of NDM demand forecasts will be carried out by scaling each Shipper's portfolio so that when aggregated over all Shippers they will be equal to the forecasted top down NDM demand. These scaled forecasts shall represent the NDM forecast apportionments for each Shipper. The method for generating the forecasted top down NDM demand is described in FARP-01.

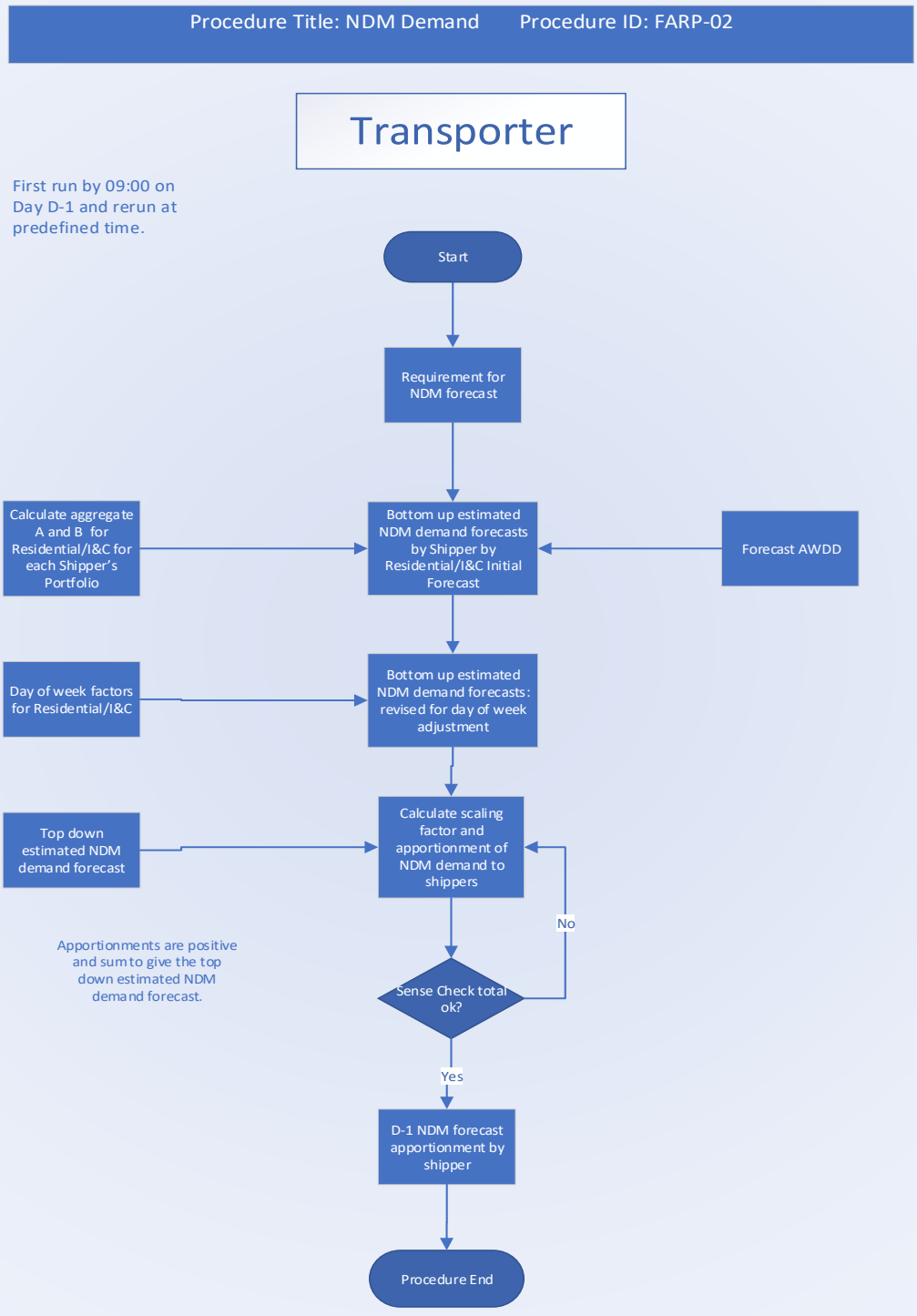
2.3.7 The Transporter shall determine whether each Shipper's forecast apportionment is positive. The minimum value for AWDD (see Ancillary Procedure 2) should generally ensure that all apportionments are non-negative. In the unlikely event that one or more negative apportionments occur at Shipper portfolio level then they shall be reset to zero and the apportionments of the remaining Shippers adjusted proportionately so that in aggregate all such apportionments match the forecasted top down NDM demand.

2.3.8 The output will thus be a set of (non-negative) forecasted top down NDM demand for all NDM Shippers, which shall be used as the basis for NDM Nomination or Renomination Advices.

2.3.9 The total forecasted top down NDM demand may be revised to reflect changes in the forecast weather or actual demand through the Day. Such a revision may precipitate an NDM Renomination Advice in which case the procedure shall be applied again to produce updated NDM forecast apportionments.

2.4 Procedure Diagram

A diagrammatic representation of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 2.4 and section 2.3, the provisions of section 2.3 shall prevail.


Procedure Title: NDM Demand
Procedure ID: FARP-02
Transporter
First run by 09:00 on Day D-1 and rerun at predefined time.
Start
Requirement for NDM forecast
Calculate aggregate A and B for Residential/I&C for each Shipper's Portfolio
Bottom up estimated NDM demand forecasts by Shipper by Residential/I&C Initial Forecast
Forecast AWDD
Day of week factors for Residential/I&C
Bottom up estimated NDM demand forecasts: revised for day of week adjustment
Top down estimated NDM demand forecast
Calculate scaling factor and apportionment of NDM demand to shippers
Apportionments are positive and sum to give the top down estimated NDM demand forecast.
Sense Check total ok?
No
Yes
D-1 NDM forecast apportionment by shipper
Procedure End

3 FARP-03 NDM Allocation Procedure

3.1 Purpose / Scope

This Procedure relates to and is to be read in conjunction with Part D, Sections 1 and 2 of the Code of Operations. The aggregate NDM Exit Allocation (i.e., actual top down NDM demand) for a Day shall be apportioned between Shippers by the Transporter by means of scaling the bottom up estimated NDM demand made in accordance with this procedure. The aggregate of all Shipper's Initial Supply Point Allocations for a Day will be equal to the aggregate NDM Exit Allocation (i.e., actual top down NDM demand) determined in accordance with this procedure and Part D, Section 2.7.3 (b) of the Code. This procedure governs the apportionment of aggregate NDM Exit Allocation (i.e., actual top down NDM demand) between Shippers. Such apportionment shall be the basis of Initial Supply Point Allocations in respect of NDM Supply Points.

3.2 Related Documentation:

- Code of Operations - Part D, Section 1 (*Nominations and Renominations*)
- Code of Operations - Part D, Section 2 (*Allocations*)

3.3 Procedure

3.3.1 Initial Supply Point Allocations shall apply to all consuming NDM Gas Points contained within NDM Supply Points. The procedure will be first applied by 16:00 on D+1, when the actual total demand, the metered LDM demand and metered DM demand for D shall be known. These will be used to generate Allocations.

3.3.2 The Transporter shall determine Allocations in a manner consistent with that described in sections 3.3.3 to 3.3.5 below. The individual A and B parameters at Gas Point level shall be summed and then used to generate Initial Supply Point Allocations for each Shipper unless section 3.3.6 below should apply, in which case Reallocations shall be determined as described in section 3.3.7.

3.3.3 The Transporter shall determine an initial bottom up estimated NDM demand for a Shipper for a Day D by applying the following formula separately to each of the Shipper's Residential and/or Industrial & Commercial portfolios:

$$\text{Demand forecast} = A_{SUM} + B_{SUM} * AWDD_{ACT}$$

Where:

A_{SUM} and B_{SUM} = the summed values of the Gas Point A and B parameters for all Residential or I&C (as the case may be) Gas Points in the Shipper's portfolio as at the end of Day D-1; and

$AWDD_{ACT}$ = the actual AWDD for Day D as calculated in the manner described in Ancillary Procedure 2.

3.3.4 The initial bottom up estimated NDM demand figure will be revised by applying a day of week adjustment. This adjustment will be determined by applying multiplication factors to the initial demand estimates for the Residential and I&C portfolios, as follows:

Adjusted demand estimate = Initial demand estimate * day of week factor

In the case of public holidays, the day of week adjustment factor for weekends will be applied. The following are the day of week factors for the gas year:

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Res	0.9567	0.9567	0.9567	0.9567	0.9567	1.0962	1.0962
I&C	1.0934	1.0934	1.0934	1.0934	1.0934	0.7925	0.7925

3.3.5 A daily allocation scaling factor will be derived as the ratio of the actual top down NDM demand to the bottom up estimated NDM demand. The scaling factor will then be applied to a Shipper's apportionment of the actual top down NDM demand to derive the Initial Supply Point Allocation for a Shipper.

3.3.6 The Transporter shall determine whether each Shipper's Initial Supply Point Allocation is positive. The minimum value for AWDD (see Ancillary Procedure 2 of this document) should generally ensure that all Allocations will be non-negative. In the unlikely event that one or more negative Allocations occur at Shipper portfolio level then such Shipper Initial Supply Point Allocations shall be reset to zero and the remaining Shipper Allocations shall be adjusted proportionately such that in aggregate they match the actual top down NDM demand for each Shipper.

Initial Supply Point Allocations will not be subject to adjustment in accordance with this section.

3.3.7 Initial Supply Point Allocations / Supply Point Reallocations shall be subject to revision up to 16:00 on M+5. Reallocations will be generated for each Shipper in the event of changes

- to Day D values of NDM total demand *or*
- to Shipper aggregates of the A and B parameters.

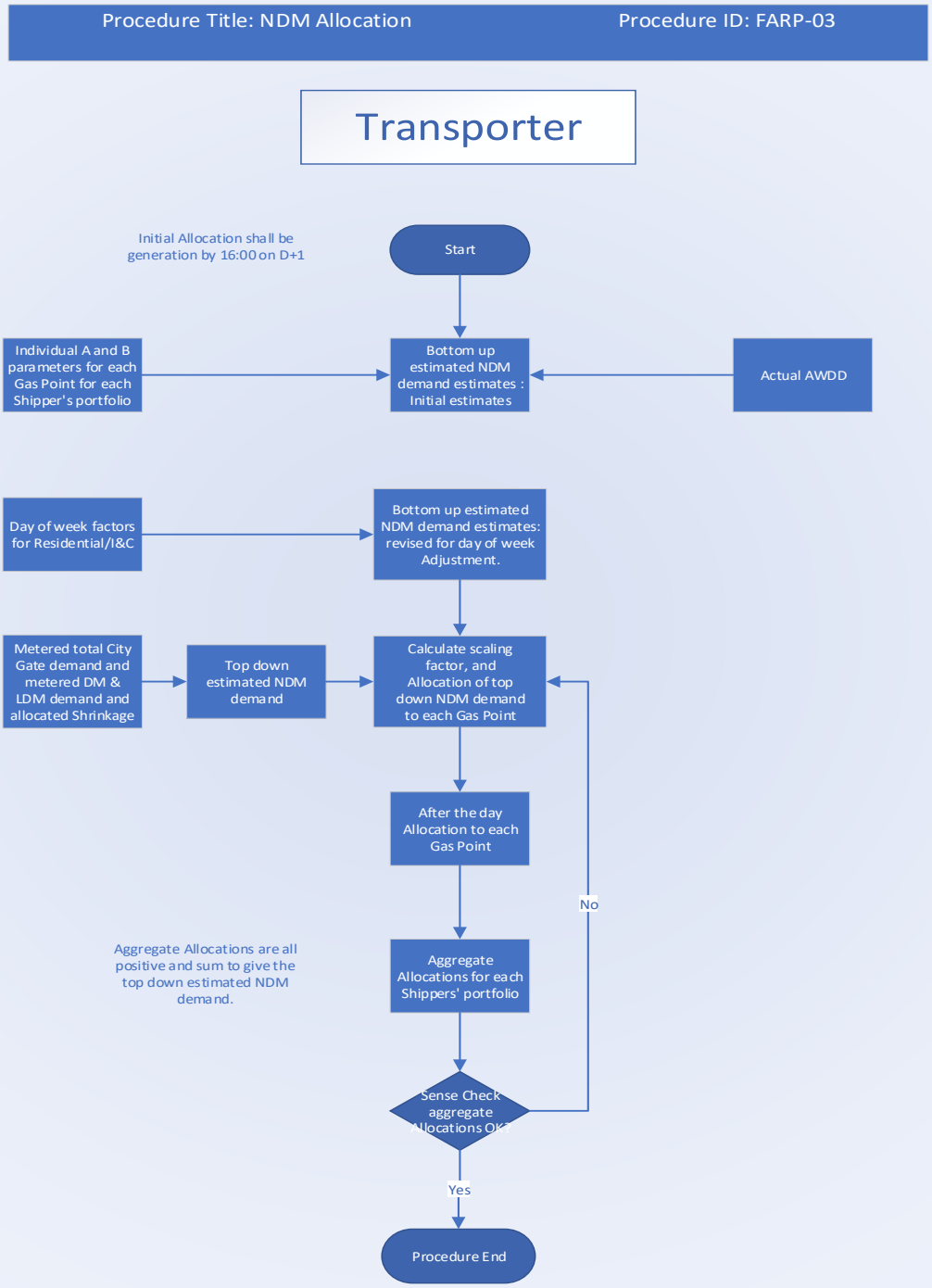
3.3.8 The daily allocation scaling factor will be amended when a Reallocation is generated. The AWDD will be fixed for Day D on D+1 and will not be altered in the revision of Allocations.

3.3.9 Final Supply Point Allocations shall be fixed on M+5, pursuant to Part D, Section 2 of the Code and there shall be no revisions after this date.

3.3.10 In the event that adjustments to Initial Supply Point Allocations should be required, such as changes to the actual top down NDM demand, then the daily allocation scaling factor will be revised to ensure that the actual top down NDM demand is equal to the bottom up estimated NDM demand.

3.4 Procedure Diagram

A diagrammatic representation of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 3.4 and section 3.3, the provisions of section 3.3 shall prevail.


Procedure Title: NDM Allocation
Procedure ID: FARP-03
Transporter
Initial Allocation shall be generation by 16:00 on D+1
Start
Individual A and B parameters for each Gas Point for each Shipper's portfolio
Bottom up estimated NDM demand estimates : Initial estimates
Actual AWDD
Day of week factors for Residential/I&C
Bottom up estimated NDM demand estimates: revised for day of week Adjustment.
Metered total City Gate demand and metered DM & LDM demand and allocated Shrinkage
Top down estimated NDM demand
Calculate scaling factor, and Allocation of top down NDM demand to each Gas Point
After the day Allocation to each Gas Point
No
Aggregate Allocations are all positive and sum to give the top down estimated NDM demand.
Aggregate Allocations for each Shippers' portfolio
Sense Check aggregate Allocations OK?
Yes
Procedure End

4 FARP-04 NDM Reconciliation Procedure: Part A

4.1 Purpose / Scope

4.1.1 This Procedure relates to and is to be read in conjunction with Part D, Section 4 of the Code of Operations. Following receipt by the Transporter of a NDM Meter Read, the Transporter shall calculate in accordance with this NDM Reconciliation Procedure the difference between the quantity of Natural Gas Allocated in accordance with Part D, Section 2 of the Code during the period to which the NDM Meter Read relates and the quantity determined by the NDM Meter Read as having been off taken from such NDM Supply Point during such period (i.e., "Reconciliation Quantity").

4.1.2 This Procedure governs the manner in which Final Supply Point Allocations are reconciled against the metered energy calculated from NDM Meter Reads. The A and B parameters at individual Gas Point level within a Supply Point shall be summed and this figure will be used to generate Initial Supply Point Allocations.

4.2 Related Documents

- FARP-05 NDM Reconciliation Procedure: Part B
- Code of Operations - Part D, Section 2 (*Allocations*)
- Code of Operations - Part D, Section 4 (*NDM Supply Point Reconciliation*)

4.3 Procedure

4.3.1 Reconciliation Quantities will be calculated on a monthly basis. The procedures governing the Reconciliation Charging Adjustments, the Monthly Reconciliation Statement and the Annual Reconciliation Statement are set out in section 5, NDM Reconciliation Procedure: Part B.5.3.2. Reconciliations will only be carried out using NDM Meter Reads. When an estimated NDM Meter Read is generated, it will not result in a Reconciliation.

4.3.2 The Transporter shall determine the Reconciliation Quantity following the end of each Month (at M+7) for all NDM Gas Points for which NDM Meter Reads have been processed in accordance with the MDS Procedures during that Month.

4.3.3 The NDM Meter Read period for all such NDM Meter Reads will be the period between the relevant NDM Meter Read and the NDM Meter Read which precedes it. Two values will be calculated for each NDM Meter Read period:

a) the metered energy for the relevant Gas Point calculated at the time the NDM Meter Read was processed by the Transporter in accordance with the MDS Procedures; and

b) the total of the daily Allocations at Gas Point level for the relevant Gas Point during the NDM Meter Read period.

4.3.4 The difference between the metered energy (4.3.3(a)) and the total allocated energy (4.3.3(b)) will determine the Reconciliation Quantity (RQ), measured in kWh, for the Gas Point for that period. Thus:

RQ = Metered energy - Total allocated energy

4.3.5 The Reconciliation Quantity for the relevant Gas Point will be recorded in respect of the relevant Shipper for inclusion in the Monthly Reconciliation Statement and for subsequent invoicing based on data contained in the Annual Reconciliation Statement.

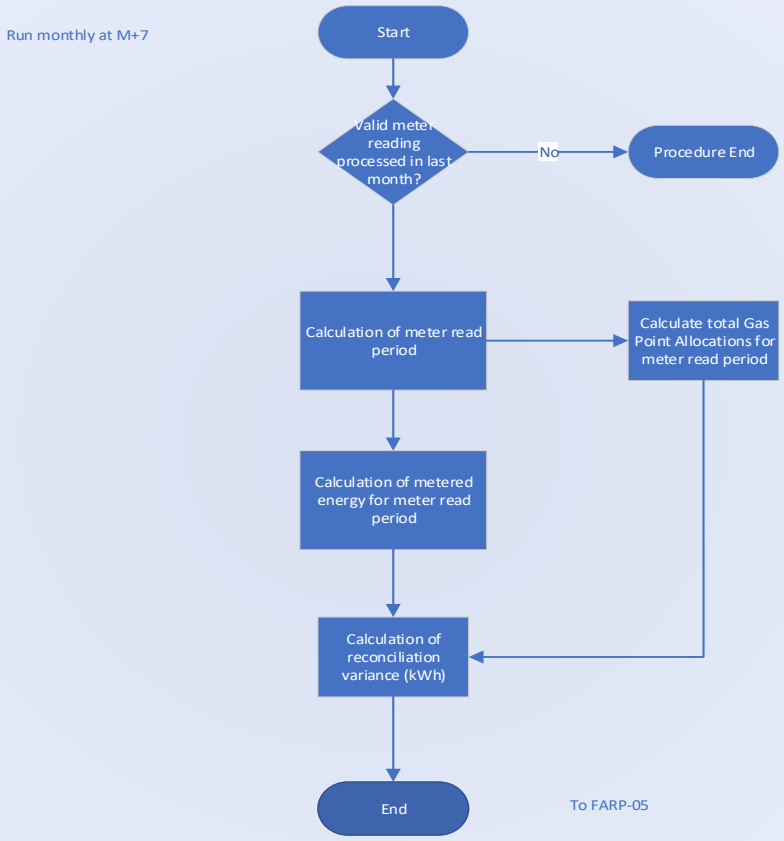
4.3.6 In the event of a Change of Shipper correction taking place in accordance with the GPRO Procedures, a Reconciliation will be required. A Reconciliation will be required relating to the period between the date of the Change of Shipper and the date on which the Change of Shipper correction is made.

4.4 Procedure Diagram

A set of diagrammatic representations of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 4.4 and section 4.3, the provisions of section 4.3 shall prevail.

Procedure Title: NDM Reconciliation Part A Procedure ID: FARP-04

Transporter



5 FARP-05 NDM Reconciliation Procedure: Part B

5.1 Purpose / Scope

This Procedure relates to and is to be read in conjunction with Part D, Section 4 of the Code of Operations. This Procedure governs:

a) the calculation of the amount of Reconciliation Charging Adjustments each Month for each NDM Shipper;

b) the provision of the Monthly Reconciliation Statement to each NDM Shipper;

c) the provision of the Annual Reconciliation Statement to each NDM Shipper; and

d) the attribution of any residual gas value to each NDM Shipper.

5.2 Related Documents

- FARP-04 NDM Reconciliation Procedure: Part A
- Code of Operations - Part D, Section 4 (*NDM Reconciliation*)
- Code of Operations - Part I, Section 11 (*Invoicing and Payment*)

5.3 Procedure

5.3.1 The Reconciliation Quantity for each NDM Gas Point for which a NDM Meter Read has been obtained, in accordance with section 4, NDM Reconciliation Procedure Part A, shall be calculated in respect of the relevant NDM Shipper.

Following the calculation of the Reconciliation Quantity the Transporter shall calculate the amount of any adjustments to be made to any charges paid or payable by the Shipper, (i.e., the Reconciliation Charging Adjustments). Each Month, the Transporter shall determine Reconciliation Charging Adjustments for each NDM Shipper by applying the Reconciliation Quantity to each of:

a) the average gas price for the period of the reconciliation, calculated as the weighted average of the monthly cash-out price for the reconciliation period. The monthly cash-out price is the weighted average of the daily balancing buy and balancing sell prices for the month;

b) the relevant Distribution Commodity Tariff (s) for the Gas Point; and

c) the relevant Transmission Exit Commodity Tariff (s).

5.3.2 The Transporter shall after the end of each Month, submit a Statement for each of the Reconciliation Charging Adjustments calculated in accordance with section 5.3.1 (a) to (c) above (i.e., Monthly Reconciliation Statement), to each NDM Shipper by twelve (12) Business Days following the

end of each Month. Each Monthly Reconciliation Statement shall show the cumulative position for each Shipper for the then current Gas Year.

5.3.3 The Monthly Reconciliation Statement will in addition show the adjustments made, in aggregate for each NDM Shipper, to account for month-end meter data cleansing at LDM and DM Supply Points.

5.3.4 The data relevant to each individual NDM Gas Point reconciliation shall also be included with the Monthly Reconciliation Statement.

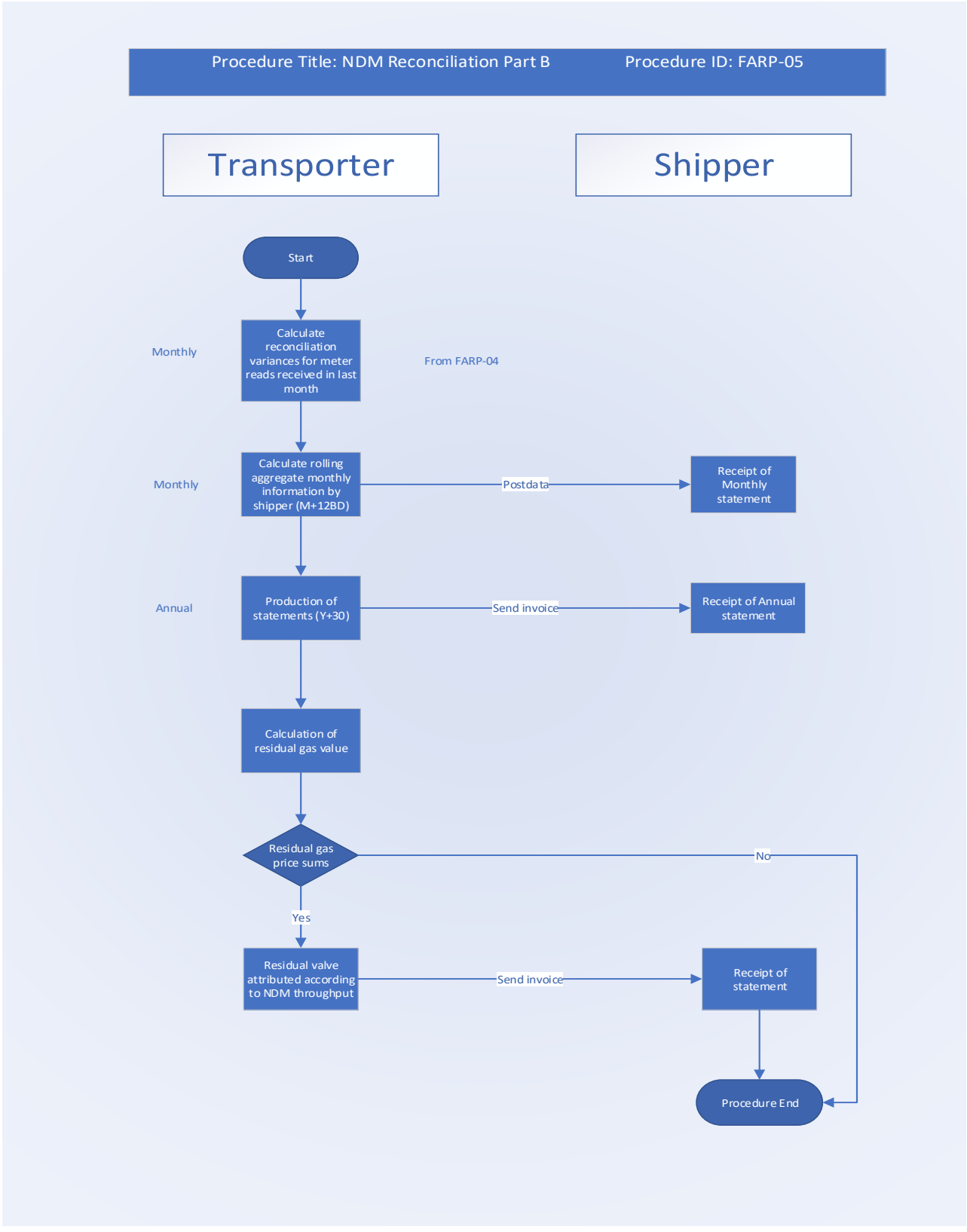
5.3.5 The Transporter shall no later than thirty (30) Business Days after the end of each Gas Year submit the Annual Reconciliation Statement to each Shipper for the preceding Gas Year.

5.3.6 The Aggregate Reconciliation Adjustments shown on the Annual Reconciliation Statement shall be payable by the Shipper to the Transporter or credited by the Transporter to the Shipper, as the case may be, in accordance with Part I, Section 11 of the Code.

5.3.7 After the end of each Gas Year, any residual gas value shall be calculated and invoiced to each Shipper. This will be calculated as the aggregate for all Shippers of those elements of the Reconciliation Charging Adjustments which relate to the gas value (as described in section 5.3.1(a) above), after deducting the effect that is attributable to Distribution Shrinkage differing from the applicable Distribution System Shrinkage Factor and taking into consideration any adjustments as outlined in section 5.3.3. In the event that this residual gas value is non-zero, the value (whether positive or negative) shall be attributed to all NDM Shippers based on their proportion of total NDM throughput over the Gas Year.

5.4 Procedure Diagram

A diagrammatic representation of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 5.4 and section 5.3, the provisions of section 5.3 of this Procedure shall prevail.


Procedure Title: NDM Reconciliation Part B
Procedure ID: FARP-05
Transporter
Shipper
Start
Monthly
Calculate reconciliation variances for meter reads received in last month
From FARP-04
Monthly
Calculate rolling aggregate monthly information by shipper (M+12BD)
Postdata
Receipt of Monthly statement
Annual
Production of statements (Y+30)
Send invoice
Receipt of Annual statement
Calculation of residual gas value
Residual gas price sums
No
Yes
Residual valve attributed according to NDM throughput
Send invoice
Receipt of statement
Procedure End

6 Ancillary Procedure 1: Calculation of A and B parameters

6.1 Purpose / Scope

6.1.1 Ancillary Procedure 1 governs the manner in which the A and B parameters used to describe the demand characteristics at each NDM Gas Point will be derived.

6.1.2 In the case of a Gas Point where gas is being consumed the procedure will be applied and the A and B parameters thus derived or updated, as the case may be, following receipt (in accordance with the MDS Procedures) of each NDM Meter Read.

6.1.3 The procedure will also apply in the following cases: following the unlocking of a meter; following a meter fit as a result of a new End User; and after a meter refit.

6.2 Related Documents

The A and B parameters are used to support other procedures as follows:

- Metering and Data Services (MDS) Procedures
- FARP-02 NDM Forecasting Procedure
- FARP-03 NDM Allocation Procedure

They will also be used to support a methodology, as approved by the Commission, for the setting of NDM Supply Point Capacity.

6.3 Procedure

6.3.1 The method for calculating Gas Point A and B parameters will vary according to the amount of valid consumption history (if any) that is available for the Gas Point at the time the calculation is to be applied.

6.3.2 For the purposes of this Ancillary Procedure 1, in the following cases the relevant Gas Point will be deemed not to have a valid consumption history:

a) when a new connection has been made;

b) where the meter is being unlocked, having previously been locked for over twenty-four months; or

c) where there has been a meter refit following a change of use e.g., different meter type or refit after twenty-four months of no consumption.

In such cases the Annual Quantity (AQ) and peak load determined by the Transporter will be used as the basis for calculating A and B. The AQ and peak load determined by the Transporter will have been ascertained from a lookup table, an illustration of which is given in Table 1 below.

6.3.3 Default values of AQ and peak load will be used for Gas Points where there is no valid consumption history (Appendix 1).

6.3.4 In the cases using default values for AQ and peak load, the values of A and B will be determined from the AQ and peak load by solving the following pair of simultaneous equations:

$$AQ = A * 365 + B * (\text{total AWDD in an average twelve-month period})$$

$$\text{Peak load} = A + B * AWDD_{PEAK}$$

Where:

$AWDD_{PEAK}$ is the 1 in 50 value of AWDD.

6.3.5 In cases where the meter is being unlocked, having previously been locked for up to twenty-four months, the A and B values prior to the meter locking will be used and the period of the locking (for which the consumption will have been zero) will be ignored.

6.3.6 In cases where there is a period of consumption history recorded for the relevant Gas Point the A and B parameters may be determined by the Transporter in one of three different ways as set out below:

a) Where there are four (4) or more periods of consumption history covering a period of eight (8) or more months then the A and B values will be calculated by applying regression analysis to the consumption history. The recorded consumptions will be regressed (using the ordinary least squares method) against the number of days in each period of consumption and the number of AWDDs in each period of consumption. The number of consumption periods used in the regression will be limited so that in total they do not cover a period greater than 1000 days. The estimate of the coefficient of the numbers of days variable will be the A parameter; that of the AWDD variable will be the B parameter. These A and B parameters will then be scaled such that the implied estimate of consumption for the relevant Gas Point for the preceding fourteen (14) month period (or as near to fourteen months as possible) matches the actual metered consumption for the same period.

   A validation check will be applied to confirm that the load factor implied by the A and B values lies between 20% and 100%. In the event that the load factor lies outside this range, the parameters will be modified to achieve a load factor equal to the limit (lower or upper as is appropriate) of the 20% to 100% range.

b) Where there are two (2) or three (3) periods of consumption history for the Gas Point, or where there are four (4) or more periods of consumption history covering a period of less than eight (8) months, it is considered that there is insufficient data to support regression analysis. In such cases the initial A and B parameters derived from the information provided by the Transporter, using the method described in section 6.3.4 above, will be scaled such that the implied estimate

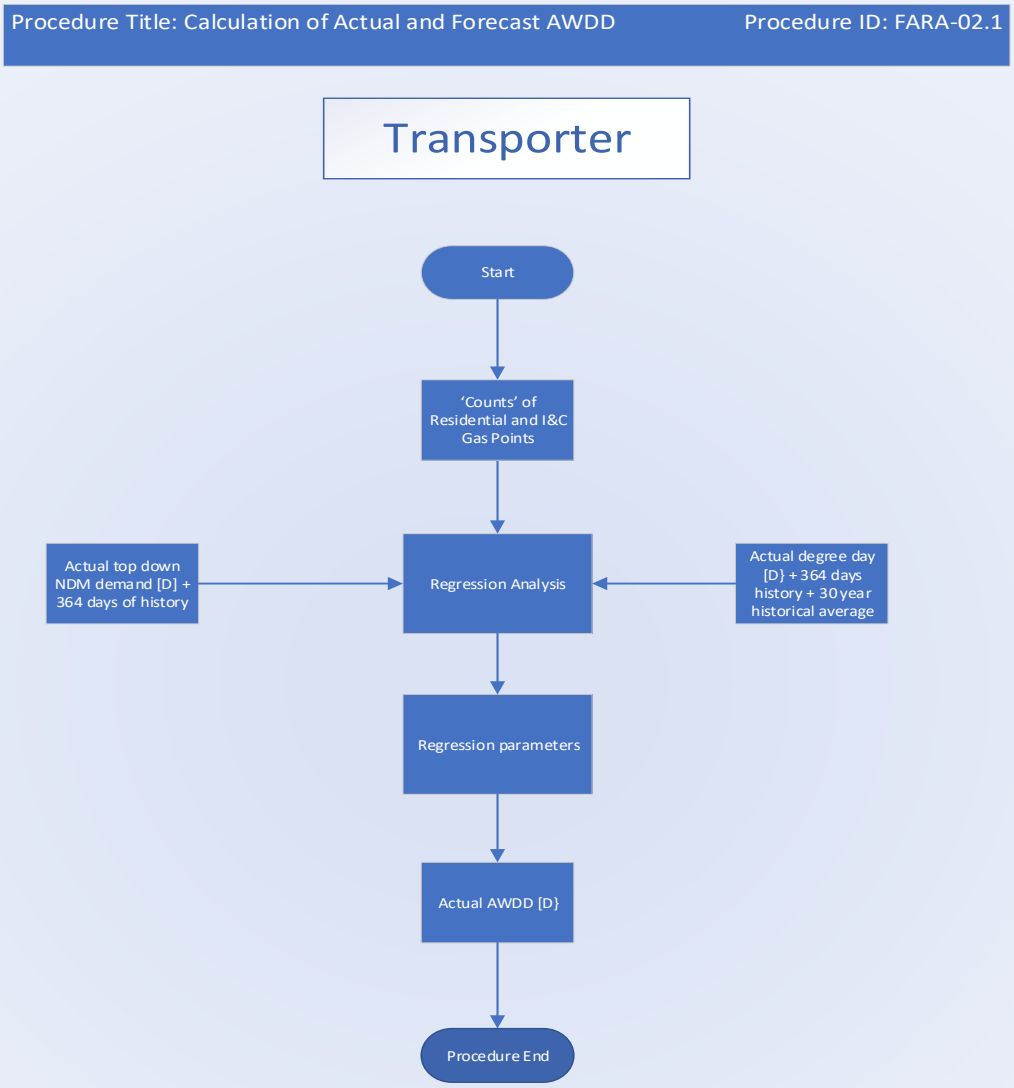
of consumption at the Gas Point for the available period of consumption history matches the actual metered consumption for that period.

c) For a Gas Point where there is a single period of consumption history the A and B parameters will be scaled to reflect the actual consumption over that period provided that the consumption period is over six (6) months.

6.3.7 Default average A and B coefficients will be used if there are insufficient NDM Meter Reads available to do a regression analysis (i.e. less than four (4) NDM Meter Reads) and if the premise/property type is unknown.

6.4 Procedure Diagram

A diagrammatic representation of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 6.4 and section 6.3, the provisions of section 6.3 shall prevail.


Procedure Title: Calculation of Actual and Forecast AWDD
Procedure ID: FARA-02.1
Transporter
Start
'Counts' of Residential and I&C Gas Points
Actual top down NDM demand [D] + 364 days of history
Regression Analysis
Actual degree day [D} + 364 days history + 30 year historical average
Regression parameters
Actual AWDD [D}
Procedure End

7 Ancillary Procedure 2: Calculation of Actual & Forecast AWDD

7.1 Purpose / Scope

This procedure governs how actual and forecast values of AWDD (Adjusted Weighted Degree-Day) will be determined by the Transporter. The AWDD is used as the explanatory variable in the estimation of daily demand at NDM Gas Points for both forecast and Allocation (after the Day) purposes.

7.2 Related Documents

The forecast or actual AWDD is used in other FAR procedures as follows:

- FARP-02 NDM Forecasting Procedure: the forecast AWDD will be used by the Transporter in determining the NDM forecast apportionment in accordance with procedure FARP-02
- FARP-03 NDM Allocation Procedure: the actual AWDD will be used by the Transporter in determining the NDM Allocation in accordance with procedure FARP-03

In addition, one thousand (1,000) of AWDD values will be used in the calculation of Gas Point A and B parameters, in accordance with Ancillary Procedure 1.

7.3 Procedure

7.3.1 Each Day (D) the actual AWDD will be calculated for the previous Day (D-1) and forecast values of AWDD will be calculated for both D and D+1. The calculation will depend on the availability of the actual top down NDM demand for D-1 and the forecasts of NDM demand for Days D and D+1. The procedure will be applied prior to 09:00 on each Day D, when these quantities become available.

7.3.2 The calculation of actual and forecast AWDD will require the following data to be available:

a) the number of consuming Residential and I&C NDM Gas Points on each of the preceding 365 days.

b) actual top down NDM demand and actual degree-day values for each of the preceding 365 days.

c) the 30-year history of degree-day data, from which a so-called long run degree-day series is calculated. The long run degree-day series will comprise a value for each day of the twelve-month period, calculated as the arithmetic average of the degree-day values on the corresponding day for each of the previous 30 years. This long run degree day series will be updated annually.

7.3.3 On Day D the Transporter shall calculate the actual AWDD for Day D-1 as follows:

a) The 365 days of actual top down NDM demand up to and including Day D-1 will be adjusted to exclude the impact of Gas Points added to and Gas Points removed from the register during the 365 days (the objective being to generate an NDM "static" series that represents the demand over the 365 day period that would be expected from the Gas Points in use at the beginning of the 365 day period).

b) This static NDM series will be regressed against the actual degree-days and the long run average degree-days in a one stage rolling regression. The regression constant for the static NDM series is the top-down A factor (A_{TOT}). The coefficients of the actual degree-days and the long run average degree-days will be added together to give the top-down B factor (B_{TOT}).

c) The actual AWDD for Day D-1 will then be derived as:

$$AWDD = (\text{static NDM demand} - A_{TOT}) / B_{TOT}$$

d) The Transporter shall endeavour to perform the above calculations by 16:00 on Day D.

7.3.4 The AWDD will represent both the variation in the weighted degree day series and the residual error from the regression and as such will provide a complete explanation for the variation in the static NDM demand series.

7.3.5 On each Day D the Transporter shall calculate the forecast AWDD for Days D and D+1 as follows:

a) The forecast NDM demand (for Day D or D+1 as the case may be) will be adjusted to exclude the impact of Gas Points added and Gas Points removed during the 365-day period. This will be the forecast of static NDM demand for the Day.

b) The forecast value of AWDD for Day D or D+1 will then be derived in a similar manner to that described above for actual AWDD:

$$\text{Forecast AWDD} = (\text{forecast static NDM demand} - A_{TOT}) / B_{TOT}$$

Where:

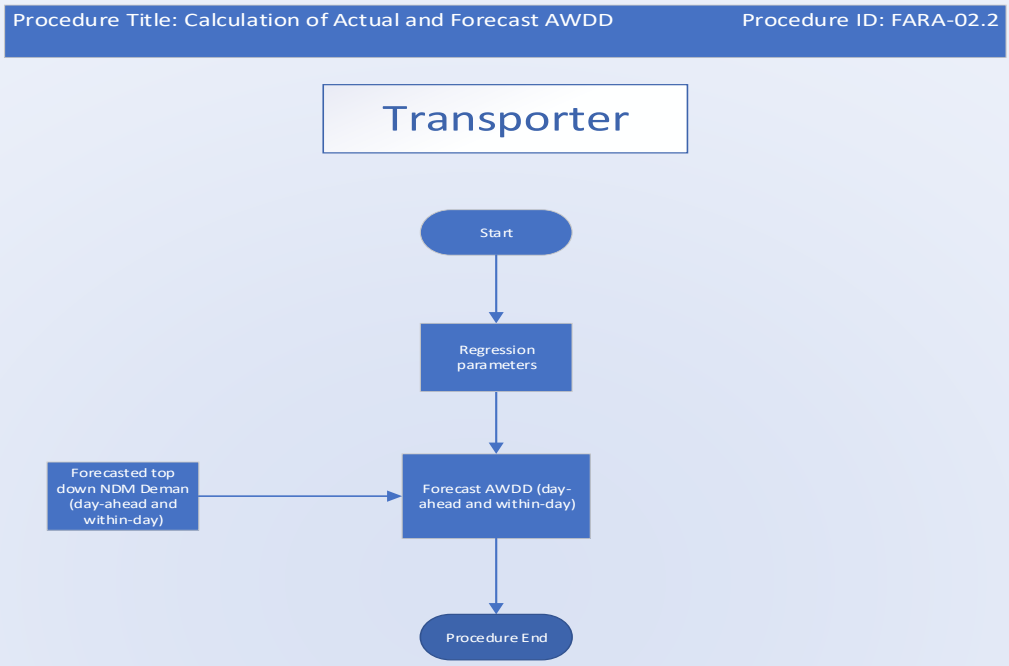
A_{TOT} and B_{TOT} are as defined above.

c) The Transporter shall endeavour to perform the above calculations by 11:00 on Day D.

7.3.6 The Transporter shall define a minimum value for AWDD values, whether actual or forecast. The AWDD to be applied on a Day will be determined as the greater of the calculated value and the defined minimum value.

7.4 Procedure Diagram

A set of diagrammatic representations of the Procedure is set out below. This is included for ease of understanding and shall have no legal effect. In the event of a conflict between this section 7.4 and section 7.3, the provisions of section 7.3 shall prevail.


Procedure Title: Calculation of Actual and Forecast AWDD
Procedure ID: FARA-02.2
Transporter
Start
Regression parameters
Forecasted top down NDM Deman (day-ahead and within-day)
Forecast AWDD (day-ahead and within-day)
Procedure End

8 Ancillary Procedure 3: Calculation of Annual Quantity and Supply Point Capacity

8.1 Purpose / Scope

This is a procedure carried out for each Gas Point before the end of each Gas Year to provide Shippers with an advice of the new values of Annual Quantity and Supply Point Capacity for the subsequent gas year.

8.2 Related Documents

- Supply Point Annual Quantity Calculation Procedure
- Distribution LDM, DM and NDM Supply Point Capacity Setting Procedure

8.3 Procedure

8.3.1 Annual Quantity ("AQ")

The AQ determines the Distribution & Transmission Tariffs and Billing Charges which apply to each Gas Point and will be updated once each Gas Year. It is expressed in kWh and is calculated from the demand for the Gas Point as follows:

Considering only physical reads with actual consumption for a period of 425 days:

Where there are four (4) or more periods of consumption history covering a period of eight (8) or more months, the AQ will be calculated using the consumption history (corresponding to the review period).

$$AQ = \text{Actual Consumption in [425] days} * (AWDD_{YEAR} / \text{Sum of AWDD in [425] days})$$

Otherwise, where there are (2) or three (3) periods of consumption history for the Gas Point, or where there are four (4) or more periods of consumption history covering a period of less than eight (8) months, it is considered that there is insufficient data to support using actual consumption and the AQ is derived using the A and B Factors at the site.

Note: The A and B Factors used are the A and B Factors calculated on the day the AQ is set and not the stored values on IUS.

$$AQ = (\text{A Factor} * 365) + (\text{B Factor} * AWDD_{YEAR})$$

8.3.2 Supply Point Capacity ("SPC")

Supply point capacities "SPC" will be updated once each Gas Year. The output of the process is a figure for the SPC, which is used for calculating the transportation charges. For new NDM Supply Points, capacities will be determined by reference to the AQ and peak load entered as part of the Supply Point registration process.

In order to achieve the targeted cost recovery for transportation capacity charges, it is necessary that the total of all NDM Supply Point Capacities should be consistent with the top down NDM Peak Load assumed in setting transportation unit charges. Capacities are therefore scaled to ensure that this is the case.

Shippers are charged based on the SPC set for each of the chargeable NDM Gas Points in their portfolio.

Supply Point Capacity is based on the following formula for Residential and small Industrial Gas Points (AQ < 73,000 kWh):

SPC = (AQ * Capacity Scaling Factor) / (Avg. Residential Load Factor * 365)

The following formula is used for Industrial & Commercial Gas Points and large residential Gas Points where (AQ >= 73,000 kWh):

SPC = (A Factor + B Factor * $AWDD_{PEAK}$) * Capacity Scaling Factor

The AQ and SPC setting at each NDM Gas Point is calculated over the review period for the subsequent Gas Year.

New SPC values shall be effective from 1 October of the subsequent Gas Year.

Appendix 1 Default values of Annual Quantity and Peak Load to be used for Gas Points where there is no valid consumption history

For Gas Points with Annual Quantity ("AQ") greater than or equal to 73,000 kWh, the Transporter will provide both the AQ and the peak load.

For Gas Points with Annual Quantity less than 73,000 kWh the peak load (*) will be determined by applying the residential (defined for these purposes as meaning Gas Points with AQ < 73,000 kWh) average load factor to the Gas Point Annual Quantity as follows:

Peak load = (AQ * Capacity Scaling Factor) / (Avg. Residential Load Factor * 365)

The Residential Average Load Factor and Capacity Scaling Factor will be determined as described in the methodology, as approved by the Commission, for the setting of NDM Supply Point Capacity and will be subject to update annually.

The AQ Default values are reviewed annually post NDM AQ and SPC setting process. New values shall be effective from 1 October of the subsequent Gas Year. There are separate values for credit meters and prepayment meters.

Default House Profile values as of 01/10/24:

Property / Premises Type	AQ (kWh) Res - Credit	AQ (kWh) Res - PPM	Peak Load (kWh/day)
Apartment	6,500	5,500	*
Standard House	9,000	7,000	*
Large House	14,000	10,000	*
One-Off House	8,000	4,500	*
I&C, AQ < 73,000 kWh	Transporter provides	Transporter provides	*
AQ ≥ 73,000 kWh	Transporter provides	Transporter provides	Transporter provides