
B. LEGAL AND GOVERNANCE

B.9 REGISTRATION OF TRADING SITE

B.9.1 General

- B.9.1.1 Any Party (or Applicant, as applicable) registering a Generator Unit shall register such Generator Unit as part of a Trading Site except as expressly provided for in paragraph B.9.1.3.
- B.9.1.2 Each Trading Site shall include at least one Generator Unit and may include a single Trading Site Supplier Unit which must contain all of the Demand for the Trading Site and only the Demand within the same Trading Site. Except as provided for in section B.9.2, each Trading Site shall include all Generator Units on the Generation Site.
- B.9.1.3 The following kinds of Generator Unit shall not be registered as part of a Trading Site:
- (a) a Pumped Storage Unit or Battery Storage Unit;
 - (b) an Aggregated Generator Unit, where the Trading Site contains a Trading Site Supplier Unit;
 - (c) an Assetless Unit.
- B.9.1.4 All Units within a registered Trading Site must be registered to the same Participant.
- B.9.1.5 If a Party (or Applicant as applicable) registering a Trading Site does not register a Trading Site Supplier Unit to that Trading Site, then on the first registration of a Generator Unit to that Trading Site, the Party (or Applicant as applicable) registering the Generator Unit shall notify the Market Operator of the identity of the Participant that shall register an Associated Supplier Unit to the Trading Site. The Participant shall register the Associated Supplier Unit in accordance with Agreed Procedure 1 "Registration".
- B.9.1.6 An Associated Supplier Unit may be registered to a different Participant than the Participant registering the other Units in the Trading Site.
- B.9.1.7 An Associated Supplier Unit may contain Demand outside of the Trading Site.
- B.9.1.8 No Supplier Unit can be both:
- (a) an Associated Supplier Unit; and
 - (b) a Trading Site Supplier Unit.
- B.9.1.9 For each Aggregated Generator Unit, a Party (or Applicant as applicable) shall register an Associated Supplier Unit to the Trading Site in accordance with paragraph B.9.1.6.

D. BALANCING MARKET DATA SUBMISSION

D.4 COMMERCIAL OFFER DATA

D.4.2 Commercial Offer Data Requirements

- D.4.2.1 Subject to paragraph D.3.2.1, a Participant is required to submit Commercial Offer Data in respect of each of its Generator Units which are Dispatchable in accordance with this section D.4.2. The required Data Records which must be included in the Commercial Offer Data are listed in Appendix I "Offer Data".
- D.4.2.2 Where any Participant submits any value for a monetary amount as part of the Commercial Offer Data for a Generator Unit, it shall express the amount in the Currency that is relevant to the Currency Zone in which the Generator Unit is registered, provided that where such an amount is in pounds sterling, the Market Operator shall, for the purposes of all calculations under this Code, convert the value to euro in accordance with Chapter G (Financial and Settlement).
- D.4.2.3 All data items submitted as part of Commercial Offer Data are deemed to apply to levels of Output which are net of Unit Load and, in the case of an Autoproducer Site, independent of Demand at that site.
- D.4.2.4 A Participant submitting Default Data in accordance with section B.7.2 and section D.3.3 in respect of a Generator Unit shall submit Complex Bid Offer Data for the Commercial Offer Data components of Default Data.
- D.4.2.5 A Participant submitting Commercial Offer Data for a Generator Unit in respect of a Trading Day may submit:
- (a) Complex Bid Offer Data, in respect of multiple Open Imbalance Settlement Periods in the format specified in Appendix I "Offer Data"; and
 - (b) Simple Bid Offer Data, in respect of each Open Imbalance Settlement Period individually in the format specified in Appendix I "Offer Data".
- D.4.2.6 Complex Bid Offer Data shall comprise the following:
- (a) In the case of Generator Units which are not Demand Side Units:
 - (i) Start Up Costs; and
 - (ii) No Load Costs,in accordance with section D.4.3;
 - (b) In the case of Generator Units which are Demand Side Units, a single Shut Down Cost in accordance with section D.4.3;
 - (c) In the case of Generator Units which are Energy Limited Generator Units, a single Energy Limit; and
 - (d) Incremental and Decremental Price Quantity Pairs in accordance with section D.4.4.
- D.4.2.7 Simple Bid Offer Data shall comprise Incremental and Decremental Price Quantity Pairs for a specified Open Imbalance Settlement Period in accordance with section D.4.4.

- D.4.2.8 Each Participant shall ensure that the Forecast Availability Profile submitted in respect of each of its Generator Units at or prior to any Gate Closure shall contain the Participant's forecast of average level of Availability, in MW, for the Generator Unit for each Imbalance Settlement Period in the Trading Day. The forecast Availability values can be positive, but cannot be negative.
- D.4.2.9 The Forecast Minimum Output Profile submitted at or prior to any Gate Closure, shall contain the Participant's forecast of the average level of Minimum Output, in MW, for the Generator Unit for each Imbalance Settlement Period in the Trading Day. The Forecast Minimum Output values must be zero except as otherwise specified.
- D.4.2.10 The Forecast Minimum Stable Generation Profile submitted at or prior to any Gate Closure, shall contain the Participant's forecast of the average level of Minimum Stable Generation, in MW, for the Generator Unit for each Imbalance Settlement Period in the Trading Day. The Forecast Minimum Stable Generation values can be positive but cannot be negative.
- D.4.2.11 A Participant shall ensure that values of the Forecast Availability Profile submitted in respect of Pumped Storage Units or Battery Storage Units, as part of Commercial Offer Data, shall be equal to the expected generation availability for that Pumped Storage Unit or Battery Storage Unit (as the case may be) in each relevant Imbalance Settlement Period.
- D.4.2.12 A Participant shall ensure that values of the Forecast Minimum Output Profile submitted in respect of Pumped Storage Units or Battery Storage Units, as part of Commercial Offer Data, shall be equal to the expected pumping capability for that Pumped Storage Unit or storage capability for that Battery Storage Unit (as the case may be) in each relevant Imbalance Settlement Period.
- D.4.2.13 Participants shall submit Commercial Offer Data in accordance with the provisions of Appendix I "Offer Data" of the Code, for each of their Demand Side Units in respect of its offered Demand Reduction.
- D.4.2.14 A Participant shall ensure that values of the Energy Limit submitted in respect of Energy Limited Generator Units must not exceed the total energy that the Energy Limited Generator Unit is physically capable of generating during the Trading Day.

D.5 TECHNICAL OFFER DATA

D.5.2 Technical Offer Data Requirements

- D.5.2.1 The required Data Records which must be included in the Technical Offer Data are set out in Appendix I "Offer Data".
- D.5.2.2 Each Participant shall use reasonable endeavours in accordance with Prudent Electric Utility Practice to ensure that all data items submitted as part of Technical Offer Data in respect of each of its Generator Units are accurate and reflect the real capabilities of the relevant Generator Unit at the point where the Unit is Connected, net of Unit Load and with due regard for the impact of forecast ambient conditions on that Generator Unit.
- D.5.2.3 Each Participant shall use reasonable endeavours in accordance with Prudent Electric Utility Practice to ensure that Technical Offer Data (including Default Data) submitted in respect of each of its Generator Units shall be consistent with data which is submitted under the applicable Grid Code in respect of the relevant Unit, provided

that Technical Offer Data submitted under this Code must be net of Unit Load and shall not be scaled by any Distribution Loss Adjustment Factor.

D.5.2.4 A Participant shall submit additional Data Records in the Technical Offer Data in respect of each of its Pumped Storage Units. These additional Data Records shall be submitted in accordance with the provisions of Appendix I “Offer Data” and shall be as follows:

- (a) Pumped Storage Cycle Efficiency ($FPSCE_{ut}$), submitted as a single value for each Trading Day to apply to all Imbalance Settlement Periods, γ , within that Trading Day, t . The value of Pumped Storage Cycle Efficiency shall in all cases be submitted as greater than 0% and less than or equal to 100% (with the specific value calculated as the relevant quantity of Generation divided by the relevant quantity of Demand);
- (b) Off to Generating Time expressed as a whole number of minutes for each Pumped Storage Unit, u , within Trading Day, t ;
- (c) Off to Spin Pump Time expressed as a whole number of minutes for each Pumped Storage Unit, u , within Trading Day, t ;
- (d) Spin Pump to Pumping Energy Time expressed as a whole number of minutes for each Pumped Storage Unit, u , within Trading Day, t ;
- (e) Maximum Storage Quantity ($QPSMAXL_{ut}$) expressed in terms of generation (MWh) for each Pumped Storage Unit, u , within Trading Day, t ;
- (f) Minimum Storage Quantity ($QPSMINL_{ut}$) expressed in terms of generation (MWh) for each Pumped Storage Unit, u , within Trading Day, t ; and
- (g) Pumping Capacity expressed in terms of Output (MW) for each Pumped Storage Unit, u , within Trading Day, t .

D.5.2.5 A Participant shall submit additional Data Records in the Technical Offer Data in respect of each of its Battery Storage Units. These additional Data Records shall be submitted in accordance with the provisions of Appendix I “Offer Data” and shall be as follows:

- (a) Battery Storage Efficiency ($FBSE_{ut}$), submitted as a single value for each Trading Day to apply to all Imbalance Settlement Periods, γ , within that Trading Day, t . The value of Battery Storage Efficiency shall in all cases be submitted as greater than 0% and less than or equal to 100% (with the specific value calculated as the relevant quantity of Generation divided by the relevant quantity of Demand);
- (b) Maximum Battery Storage Quantity ($QBSMAXL_{ut}$) expressed in terms of generation (MWh) for each Battery Storage Unit, u , within Trading Day, t ;
- (c) Minimum Battery Storage Quantity ($QBSMINL_{ut}$) expressed in terms of generation (MWh) for each Battery Storage Unit, u , within Trading Day, t ; and
- (d) Battery Storage Capacity expressed in terms of Output (MW) for each Battery Storage Unit, u , within Trading Day, t .

D.5.2.6 For all Pumped Storage Units or Battery Storage Units which utilise the same reservoir or stored energy for any Imbalance Settlement Period, the relevant Participant shall ensure that the values of Maximum Storage Quantity or Maximum

Battery Storage Quantity, as the case may be, for the associated Imbalance Settlement Period shall be equal.

- D.5.2.7 For all Pumped Storage Units or Battery Storage Units which utilise the same reservoir or stored energy for any Imbalance Settlement Period, the relevant Participant shall ensure that the values of Minimum Storage Quantity or Minimum Battery Storage Quantity, as the case may be, for the associated Imbalance Settlement Period shall be equal.
- D.5.2.8 In respect of Generation at an Autoproducer Site, all Data Records submitted as part of Technical Offer Data are deemed to apply to levels of Output which are net of Unit Load and independent of Demand at that site.
- D.5.2.9 Participants shall submit Technical Offer Data in accordance with the provisions of Appendix I “Offer Data” of the Code, for each of their Demand Side Units in respect of its offered Demand Reduction.

F. CALCULATION OF PAYMENTS AND CHARGES

F.2 DATA SOURCES, CONVENTIONS AND DEFINITIONS

F.2.1 Interpretation

- F.2.1.1 For each Imbalance Pricing Period, ϕ , and each Imbalance Settlement Period, γ , as applicable for the relevant process, for the purposes of this Code, the Bid Offer Acceptance subscript, o , resets to zero so that the first Bid Offer Acceptance in the period has a subscript value of $o = 1$.
- F.2.1.2 The Market Operator shall set the value of a variable at zero where this Code states that a provision does not apply to a Unit, and where the variable which is the result of that provision is to be used in a later process for that Unit.
- F.2.1.3 The Market Operator shall determine whether a Pumped Storage Generator Unit, u , is in Pumping Mode for the purposes of the calculations in this Code as follows:
- (a) If the value of a Pumped Storage Unit's Dispatch Quantity ($qD_{uoy}(t)$) at all times within an Imbalance Settlement Period, γ , is positive (i.e. in the generating range of the Unit's output), then the Unit is deemed to be in Generating Mode for the entirety of that Imbalance Settlement Period; and
 - (b) If the value of a Pumped Storage Unit's Dispatch Quantity ($qD_{uoy}(t)$) at any time within an Imbalance Settlement Period, γ , is negative (i.e. in the pumping range of the Unit's output), then the Unit is deemed to be in Pumping Mode for the entirety of that Imbalance Settlement Period.
- F.2.1.4 The Market Operator shall determine whether a Battery Storage Generator Unit, u , is in Charging Mode for the purposes of the calculations in this Code as follows:
- (a) If the value of a Battery Storage Unit's Dispatch Quantity ($qD_{uoy}(t)$) at all times within an Imbalance Settlement Period, γ , is positive (i.e. in the generating range of the Unit's output), then the Unit is deemed to be in Generating Mode for the entirety of that Imbalance Settlement Period; and
 - (b) If the value of a Battery Storage Unit's Dispatch Quantity ($qD_{uoy}(t)$) at any time within an Imbalance Settlement Period, γ , is negative (i.e. in the charging range of the Unit's output), then the Unit is deemed to be in Charging Mode for the entirety of that Imbalance Settlement Period.
- F.2.1.5 An "Incremental Action" ("Inc") is a System Operator action intended to increase the power (MW) or energy (MWh) being sent out into the system, or decrease the power or energy being taken from the system. Inc power or energy quantities are positive, resulting from the Dispatch Quantity for a Bid Offer Acceptance being higher than the Dispatch Quantity for the previous Bid Offer Acceptance for the Generator Unit in respect of an Imbalance Pricing Period or Imbalance Settlement Period (as appropriate), or being higher than the Final Physical Notification Quantity if there is no previous Bid Offer Acceptance for the Generator Unit in respect of the Imbalance Pricing Period or Imbalance Settlement Period (as appropriate), for a Unit at any point in time. Incremental Actions are represented in settlement through Accepted Offer Quantities.
- F.2.1.6 A "Decremental Action" ("Dec") is a System Operator action intended to decrease the power (MW) or energy (MWh) being sent out into the system, or increase the power

or energy being taken from the system. Dec power or energy quantities are negative, resulting from the Dispatch Quantity for a Bid Offer Acceptance being lower than the Dispatch Quantity for the previous Bid Offer Acceptance for the Generator Unit in respect of an Imbalance Pricing Period or Imbalance Settlement Period (as appropriate), or being lower than the Final Physical Notification Quantity if there is no previous Bid Offer Acceptance for the Generator Unit in respect of the Imbalance Pricing Period or Imbalance Settlement Period (as appropriate), for a Unit at any point in time. Decremental Actions are represented in settlement through Accepted Bid Quantities.

- F.2.1.7 Variables for power (expressed as MW) quantities begin with a lower case “q”, while variables for energy (expressed as MWh) quantities begin with an upper case “Q”.
- F.2.1.8 A Scheduling Agent is the entity or entities with the task of providing details of Ex-Ante Market Contracted Quantities from market participants to TSOs, or where applicable third parties, in accordance with Article 111 of the EU Guideline on Electricity Transmission System Operation.
- F.2.1.9 A variable which is a function of time may have a different value at each time within an Imbalance Settlement Period, γ , or Imbalance Pricing Period, ϕ , rather than a single fixed value defined for all times within an Imbalance Settlement Period, γ , or Imbalance Pricing Period, ϕ . Such variables are represented with the inclusion of the notation ‘(t)’ at the end of the variable term.
- F.2.1.10 For the purposes of all calculations in this Code, each quantity and price calculated, deemed or defined in respect of a Generator Unit which is not Dispatchable shall be deemed, where applicable, to be at Band number $i = 1$, with the corresponding value for $qBOUR_{u(i=1)h}(t)$ or $qBOUR_{u(i=1)\gamma}(t)$, as applicable, being a sufficiently high value that it is greater than the value of all function of time Dispatch Quantities ($qD_{uoh}(t)$ or $qD_{uoy}(t)$, as applicable) and the function of time Final Physical Notification Quantity ($qFPN_{uh}(t)$ or $qFPN_{uy}(t)$, as applicable) for the Generator Unit, u , in the Period, h , or Imbalance Settlement Period, γ , as applicable.

F.3 DETERMINATION OF TIMES AND RELEVANT COMMERCIAL OFFER DATA FOR BID OFFER ACCEPTANCES

F.3.3 Commercial Offer Data to be Used

- F.3.3.1 For the purposes of calculating the Imbalance Price in an Imbalance Pricing Period, ϕ , in calculating Accepted Bid Quantity and Accepted Offer Quantity, and determining the relevant Bid Offer Price, in respect of a Bid Offer Acceptance, the Market Operator shall use the following Commercial Offer Data:
 - (a) If the Bid Offer Acceptance Time is before the Gate Closure 2 in respect of the Imbalance Settlement Period containing the Bid Offer Opening Time, the most recently submitted valid Complex Bid Offer Data for the relevant Trading Day as at the Bid Offer Acceptance Time; and
 - (b) Otherwise, the most recently submitted valid Simple Bid Offer Data for the relevant Imbalance Settlement Period as at the Bid Offer Acceptance Time.
- F.3.3.2 For the purposes of calculating settlement quantities in an Imbalance Settlement Period, γ , in calculating Accepted Bid Quantity and Accepted Offer Quantity, and

determining the relevant Bid Offer Price, in respect of a Bid Offer Acceptance, the Market Operator shall use the following Commercial Offer Data:

- (a) If the Bid Offer Acceptance Time is before the Gate Closure 2 in respect of the Imbalance Settlement Period containing the Bid Offer Opening Time, the most recently submitted valid Complex Bid Offer Data for the relevant Trading Day as at the Bid Offer Acceptance Time;
- (b) If any Bid Offer Acceptance for Generator Unit, u , at rank, k , has, after applying the Flagging and Tagging process in accordance with Chapter E (Imbalance Pricing), a Net Imbalance Volume Tag ($TNIV_{uk\phi}$) with a value less than one, or a System Operator Flag ($FSO_{uk\phi}$) with a value less than one, for any Imbalance Pricing Period, ϕ , within the Imbalance Settlement Period, γ , the most recently submitted valid Complex Bid Offer Data for the relevant Trading Day as at the Bid Offer Acceptance Time,

where:

- (i) $FSO_{uk\phi}$ is the System Operator Flag for Generator Unit, u , and rank, k , in Imbalance Pricing Period, ϕ , determined in accordance with Chapter E (Imbalance Pricing) and where in the absence of a value for the period resulting from the process outlined in Chapter E (Imbalance Pricing) a value of one shall be used; and
 - (ii) $TNIV_{uk\phi}$ is the value of the Net Imbalance Volume Tag for Generator Unit, u , and rank, k , in Imbalance Pricing Period, ϕ , determined in accordance with Chapter E (Imbalance Pricing) and where in the absence of a value for the period resulting from the process outlined in Chapter E (Imbalance Pricing) a value of one shall be used;
 - (iii) If for all Generator Units, u , and all Imbalance Pricing Periods, ϕ , within the Imbalance Settlement Period, γ , there is insufficient data to carry out the steps described in paragraph F.3.3.2(b), then the most recently submitted valid Complex Bid Offer Data for the relevant Trading Day as at the Bid Offer Acceptance Time shall be used for all Generator Units in that Imbalance Settlement Period.
- (c) Otherwise, the most recently submitted valid Simple Bid Offer Data for the Imbalance Settlement Period as at the Bid Offer Acceptance Time.

F.3.3.3 Where in accordance with paragraphs F.3.3.1 or F.3.3.2 the Market Operator is required to use Complex Bid Offer Data, it shall use the following Commercial Offer Data for each Imbalance Settlement Period relevant to the Bid Offer Acceptance:

- (a) The Complex Bid Offer Data (if any) that was valid for the Imbalance Settlement Period containing the Bid Offer Opening Time most recently submitted as at the Bid Offer Acceptance Time; or
- (b) Otherwise, the valid Commercial Offer Data components of Default Data that had been most recently submitted as at the Bid Offer Acceptance Time.

F.3.3.4 Where in accordance with paragraphs F.3.3.1 or F.3.3.2 the Market Operator is required to use Simple Bid Offer Data, it shall use the following Commercial Offer Data for each Imbalance Settlement Period relevant to the Bid Offer Acceptance:

- (a) The Simple Bid Offer Data (if any) that was valid for the Imbalance Settlement Period relevant to the Bid Offer Acceptance and had been most recently submitted as at the Bid Offer Acceptance Time; or
- (b) Otherwise, the Price Quantity Pair data of the Complex Bid Offer Data that it would be required to use in accordance with paragraph F.3.3.3(a) or F.3.3.3(b), as applicable, were that paragraph to apply.

F.4 IMBALANCE COMPONENT PAYMENTS AND CHARGES

F.4.3 Calculation of Imbalance Component Payments and Charges

- F.4.3.1 Except as provided in paragraph F.5.3.3, the Market Operator shall calculate the Imbalance Component Payment or Charge ($CIMB_{uy}$) for each Generator Unit (other than an Interconnector Error Unit or an Interconnector Residual Capacity Unit), u , in each Imbalance Settlement Period, γ , as follows:

$$CIMB_{uy} = PIMB_{\gamma} \times (QMLF_{uy} - QEX_{uy})$$

where:

- (a) $PIMB_{\gamma}$ is the Imbalance Settlement Price in Imbalance Settlement Period, γ , calculated in accordance with Chapter E (Imbalance Pricing);
- (b) $QMLF_{uy}$ is the Loss-Adjusted Metered Quantity for Generator Unit, u , in Imbalance Settlement Period, γ ; and
- (c) QEX_{uy} is the Ex-Ante Quantity for Generator Unit, u , in Imbalance Settlement Period, γ .

- F.4.3.2 The Market Operator shall calculate the Imbalance Component Payment or Charge ($CIMB_{vy}$) for each Supplier Unit, v , in Imbalance Settlement Period, γ , as follows:

if ($SSPF_{vy} = 0$), then

$$CIMB_{vy} = PIMB_{\gamma} \times (QMLF_{vy} - QEX_{vy})$$

Else

$$CIMB_{vy} = 0$$

where:

- (a) $SSPF_{vy}$ is the DS3 System Service Provider Flag for Supplier Unit, v , in Imbalance Settlement Period, γ .
- (b) $PIMB_{\gamma}$ is the Imbalance Settlement Price in Imbalance Settlement Period, γ , calculated in accordance with Chapter E (Imbalance Pricing);
- (c) $QMLF_{vy}$ is the Loss-Adjusted Metered Quantity for Supplier Unit, v , in Imbalance Settlement Period, γ ; and

- (d) $QEX_{v\gamma}$ is the Ex-Ante Quantity for Supplier Unit, v, in Imbalance Settlement Period, γ .

F.4.3.3 The Market Operator shall calculate the Imbalance Component Payment or Charge ($CIMB_{u\gamma}$) for each Pumped Storage Unit or Battery Storage Unit, u, in each Imbalance Settlement Period, γ , for which it is in Pumping Mode (as determined in paragraph F.2.1.3) or in Charging Mode (as determined in paragraph F.2.1.4), as the case may be, as follows:

$$CIMB_{u\gamma} = PIMB_{\gamma} \times \left(\sum_o \sum_i (QAOLF_{uo\gamma} - \text{Max}(QAOBIAS_{uo\gamma}, QAOUNDEL_{uo\gamma})) + \sum_o \sum_i (QABLF_{uo\gamma} - \text{Min}(QABBIAS_{uo\gamma}, QABUNDEL_{uo\gamma})) \right)$$

where:

- (a) $PIMB_{\gamma}$ is the Imbalance Settlement Price in Imbalance Settlement Period, γ , calculated in accordance with Chapter E (Imbalance Pricing);
- (b) \sum_o is a summation over all Bid Offer Acceptances, o;
- (c) \sum_i is a summation over all Bands, i;
- (d) $QAOLF_{uo\gamma}$ is the Loss-Adjusted Accepted Offer Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ ;
- (e) $QABLF_{uo\gamma}$ is the Loss-Adjusted Accepted Bid Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ ;
- (f) $QAOUNDEL_{uo\gamma}$ is the Undelivered Accepted Offer Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ ;
- (g) $QABUNDEL_{uo\gamma}$ is the Undelivered Accepted Bid Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ ;
- (h) $QAOBIAS_{uo\gamma}$ is the Biased Accepted Offer Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ ; and
- (i) $QABBIAS_{uo\gamma}$ is the Biased Accepted Bid Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, γ .

F.4.3.4 The Market Operator shall calculate the Imbalance Component Payment or Charge ($CIMB_{u\gamma}$) for each Interconnector Residual Capacity Unit, u, in each Imbalance Settlement Period, γ , as follows:

$$CIMB_{u\gamma} = PIMB_{\gamma} \times \left(\sum_o \sum_i (QAOLF_{uo\gamma}) + \sum_o \sum_i (QABLF_{uo\gamma}) \right)$$

where:

- (a) $PIMB_{\gamma}$ is the Imbalance Settlement Price in Imbalance Settlement Period, γ , calculated in accordance with Chapter E (Imbalance Pricing);
- (b) \sum_o is a summation over all Bid Offer Acceptances, o ;
- (c) \sum_i is a summation over all Bands, i ;
- (d) $QAOLF_{uoi\gamma}$ is the Loss-Adjusted Accepted Offer Quantity for Interconnector Residual Capacity Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, γ ; and
- (e) $QABLF_{uoi\gamma}$ is the Loss-Adjusted Accepted Bid Quantity for Interconnector Residual Capacity Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, γ .

F.4.3.5 The Market Operator shall calculate the Imbalance Component Payment or Charge ($CIMB_{u\gamma}$) for each Interconnector Error Unit, u , in each Imbalance Settlement Period, γ , as follows:

$$CIMB_{u\gamma} = PIMB_{\gamma} \times \left(QMLF_{u\gamma} - QEX_{u\gamma} - \left(\sum_o \sum_i (QAOLF_{uoi\gamma}) + \sum_o \sum_i (QABLF_{uoi\gamma}) \right) \right)$$

where:

- (a) $PIMB_{\gamma}$ is the Imbalance Settlement Price in Imbalance Settlement Period, γ , calculated in accordance with Chapter E (Imbalance Pricing);
- (b) \sum_o is a summation over all Bid Offer Acceptances, o ;
- (c) \sum_i is a summation over all Bands, i ;
- (d) $QMLF_{u\gamma}$ is the Loss-Adjusted Metered Quantity for Generator Unit, u , in Imbalance Settlement Period, γ ;
- (e) $QEX_{u\gamma}$ is the Ex-Ante Quantity for Generator Unit, u , in Imbalance Settlement Period, γ ;
- (f) $QAOLF_{uoi\gamma}$ is the Loss-Adjusted Accepted Offer Quantity for Interconnector Residual Capacity Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, γ ; and
- (g) $QABLF_{uoi\gamma}$ is the Loss-Adjusted Accepted Bid Quantity for Interconnector Residual Capacity Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, γ .

F.9 UNINSTRUCTED IMBALANCE QUANTITIES AND CHARGES

F.9.1 Calculation of Uninstructed Imbalance Charges

F.9.1.4 Subject to paragraph F.9.4.2, the Market Operator shall calculate the Uninstructed Imbalance Charge ($CUNIMB_{uy}$) for each Generator Unit, u , in each Imbalance Settlement Period, y , as follows:

If $PBO_{uoy} - PIMB_y \neq 0$, then

$$CUNIMB_{uoy} = \left(FDOG_{uy} \times \left(\frac{\text{Min}((PBO_{uoy} - PIMB_y), 0)}{PBO_{uoy} - PIMB_y} \right) \times (|PBO_{uoy}| - |PIMB_y|) \times (QABUNDELOTOL_{uoy}) \right) + \left(-FPUG_{uy} \times |PIMB_y| \right)$$

$$CUNIMB_{uy} = \text{Min}(QUNDELOTOL_{uy}, 0) \times (FPUG_{uy} \times |PIMB_y|) + \text{Max}(QUNDELOTOL_{uy}, 0) \times (-FDOG_{uy} \times |PIMB_y|)$$

If $PBO_{uoy} - PIMB_y = 0$, then

$$CUNIMB_{uy} = \text{Min}(QUNDELOTOL_{uy}, 0) \times (FPUG_{uy} \times |PIMB_y|) + \text{Max}(QUNDELOTOL_{uy}, 0) \times (-FDOG_{uy} \times |PIMB_y|)$$

where:

- (a) $QUNDELOTOL_{uy}$ is the Outside Tolerance Undelivered Quantity for Generator Unit, u , in Imbalance Settlement Period, y .
- (b) $QAOUNDELOTOL_{uoyin}$ is the Outside Tolerance Undelivered Accepted Offer Quantity for Generator Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, y .
- (c) $QABUNDELOTOL_{uoyin}$ is the Outside Tolerance Undelivered Accepted Bid Quantity for Generator Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, y .
- (d) $PIMB_y$ is the Imbalance Settlement Price in Imbalance Settlement Period, y , calculated in accordance with Chapter E (Imbalance Pricing);
- (e) PBO_{uoy} is the Bid Offer Price for each Outside Tolerance Undelivered Accepted Bid Quantity and Outside Tolerance Accepted Offer Quantity for Generator Unit, u , for Bid Offer Acceptance, o , for Band, i , in Imbalance Settlement Period, y ;

- (f) \sum_o is a summation over all Bid Offer Acceptances, o;
- (g) \sum_i is a summation over all Bands, i;
- (h) $FPUG_{uy}$ is the Premium for Under Generation Factor for Generator Unit, u, in Imbalance Settlement Period, y; and
- (i) $FDOG_{uy}$ is the Discount for Over Generation Factor for Generator Unit, u, in Imbalance Settlement Period, y.
- (j) $CUNIMBA_{uoiy}$ is the Uninstructed Imbalance Adjustment Charge for Generator Unit, u, for Bid Offer Acceptance, O, for Band, i, in Imbalance Settlement Period, y which is an interim amount required to calculate the final value for $CUNIMB_{uy}$.
- (k) $|PIMB_y|$ is the absolute value of the Imbalance Settlement Price in Imbalance Settlement Period, y, calculated in accordance with Chapter E (Imbalance Pricing); and
- (l) $|PBO_{uoiy}|$ is the absolute value of the Bid Offer Price for each Outside Tolerance Undelivered Accepted Bid Quantity and Outside Tolerance Accepted Offer Quantity for Generator Unit, u, for Bid Offer Acceptance, o, for Band, i, in Imbalance Settlement Period, y.

F.9.1.5 When a Pumped Storage Unit or Battery Storage, u, is in Pumping Mode or Charging Mode, as the case may be, for an Imbalance Settlement Period, y, or any part thereof, the Market Operator shall calculate the Uninstructed Imbalance Charge ($CUNIMB_{uy}$) for that Pumped Storage Unit or Battery Storage Unit, u, in that Imbalance Settlement Period, y, as having a value of zero.

F.13 TESTING CHARGES

F.13.1 Setting Testing Tariffs

F.13.1.1 If requested by the Regulatory Authorities, the relevant System Operator shall report to the Regulatory Authorities proposing values for the Testing Tariffs at least four months before the start of the Year to which they shall apply. The System Operator's report must set out the justification for the specific values proposed. The report may, and shall if so requested by the Regulatory Authorities, include alternative values from those proposed and must set out the arguments for and against such alternatives.

F.13.1.2 Each System Operator shall provide to the Market Operator at least two months prior to the start of each Year or within 5 Working Days of approval of the Testing Tariffs by the Regulatory Authorities, whichever is the later, the Testing Tariff Data Transaction, which comprises a complete set of Testing Tariffs that have been approved by the Regulatory Authorities for each Generator Unit that is registered within its Jurisdiction, for each Imbalance Settlement Period in the Year, y, in accordance with Appendix K "Other Market Data Transactions".

F.13.1.3 The Market Operator shall publish the approved Testing Tariffs for each parameter within 5 Working Days of receipt of the Regulatory Authorities' determination or two months before the start of the Year to which they shall apply, whichever is the later.

F.13.1.4 The relevant System Operator may update the Testing Tariffs within the Year to which they apply subject to the prior approval of the Regulatory Authorities. If the Testing Tariffs are so updated, the relevant System Operator shall provide the updated Testing Tariff Data Transaction to the Market Operator within 5 Working Days of approval by the Regulatory Authorities.

F.13.1.5 The Market Operator shall publish each Year the schedule of Testing Tariffs and the detailed tariff methodology and periodically in the event that the Tariffs are updated within a Year.

F.13.2 Calculation of Testing Charges

F.13.2.1 The Market Operator shall calculate the Testing Charge ($CTEST_{uy}$) for each Generator Unit, u , except for any Interconnector Error Unit, u , in each Imbalance Settlement Period, γ , for which it is Under Test as follows:

$$CTEST_{uy} = - \text{Max}(QMLF_{uy}, 0) \times PTESTTARIFF_{uy}$$

where:

- (a) $QMLF_{uy}$ is the Loss-Adjusted Metered Quantity for Generator Unit, u , Under Test in Imbalance Settlement Period, γ ; and
- (b) $PTESTTARIFF_{uy}$ is the Testing Tariff Price for Generator Unit, u , Under Test in Imbalance Settlement Period, γ , as set out in the schedule of Testing Tariffs.

F.13.2.2 The Market Operator shall calculate the Testing Charge ($CTEST_{uy}$) for each Interconnector Error Unit, u , in each Imbalance Settlement Period, γ , for which it is Under Test as follows:

If $QMLF_{uy} > 0$ then

$$CTEST_{uy} = - \text{Max}(QMLF_{uy}, 0) \times PTESTTARIFF_{uy}$$

else

$$CTEST_{uy} = QMLF_{uy} \times PTESTTARIFF_{uy}$$

where:

- (a) $QMLF_{uy}$ is the Loss-Adjusted Metered Quantity for Interconnector Error Unit, u , Under Test in Imbalance Settlement Period, γ ; and
- (b) $PTESTTARIFF_{uy}$ is the Testing Tariff Price for Generator Unit, u , Under Test in Imbalance Settlement Period, γ , as set out in the schedule of Testing Tariffs.