
D. BALANCING MARKET DATA SUBMISSION

D.3 TIMING OF DATA SUBMISSION

D.3.2 Data Submission

D.3.2.1 The provisions of this section D.3.2 do not apply to any Unit which is:

- (a) an Assetless Unit;
- (b) a Trading Unit;
- (c) an Interconnector Error Unit; or
- (d) an Interconnector Residual Capacity Unit.

D.3.2.2 Prior to Gate Closure 1 in respect of each Trading Day, a Participant shall submit for each of its Generator Units which are Dispatchable and Generator Units which are Controllable and not Dispatchable and do not have Priority Dispatch:

- (a) Commercial Offer Data;
- (b) a Validation Data Set Number;
- (c) Physical Notification Data;
- (d) a Forecast Availability Profile;
- (e) a Forecast Minimum Output Profile; and
- (f) a Forecast Minimum Stable Generation Profile,

in respect of every Imbalance Settlement Period in that Trading Day, as specified in this Code and in accordance with Appendix I “Offer Data”.

D.3.2.3 Prior to Gate Closure 2 in respect of an Imbalance Settlement Period, a Participant may submit for any of its Generator Units which are Dispatchable or Generator Units which are Controllable and not Dispatchable and do not have Priority Dispatch:

- (a) Commercial Offer Data;
- (b) Physical Notification Data;
- (c) a Forecast Availability Profile;
- (d) a Forecast Minimum Output Profile; and/or
- (e) a Forecast Minimum Stable Generation Profile,

for that Imbalance Settlement Period and any subsequent Imbalance Settlement Period in the same Trading Day, as specified in this Code and in accordance with Appendix I “Offer Data”.

D.3.2.4 Prior to Gate Closure 2 in respect of an Imbalance Settlement Period, a Participant may submit Physical Notification Data for any of its Generator Units which have Priority Dispatch and which are not Dispatchable, and any of its Supplier Units, in respect of that Imbalance Settlement Period and any subsequent Imbalance Settlement Period in the same Trading Day, as specified in this Code and in accordance with Appendix I “Offer Data”.

- D.3.2.5 Except as otherwise provided in this Code, the Market Operator shall apply Accepted Commercial Offer Data and Accepted Technical Offer Data for each Generator Unit in the calculations under Chapter F (Calculation of Payments and Charges).
- D.3.2.6 The Market Operator may at any time query any Accepted Commercial Offer Data or Accepted Technical Offer Data it has received from a Party if the Data Record and field-level values in that CMS Data Transaction appear, pursuant to Prudent Electric Utility Practice, to be materially incorrect. This discretion of the Market Operator does not in any way diminish the obligations of each Party under paragraph B.14.1.5(d).

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 and Generator Units which are Controllable and not Dispatchable and do not have Priority Dispatch 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 **Error! Reference source not found.** 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 **Error! Reference source not found..**
- 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 **Error! Reference source not found..**
- 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.4.2.15 A Participant shall ensure that values of the Forecast Minimum Stable Generation Profile submitted in respect of a Generator Unit which is Controllable and not Dispatchable and does not have Priority Dispatch, as part of Commercial Offer Data, shall be equal to zero.

D.4.3 **Start Up Costs and No Load Costs**

- D.4.3.1 A Participant shall ensure that Complex Bid Offer Data in respect of each of its Generator Units which are not Demand Side Units shall include:
- (a) one No Load Cost;

- (b) a Cold Start Up Cost, a Warm Start Up Cost and a Hot Start Up Cost, where the Cold Start Up Cost must be greater than or equal to the Warm Start Up Cost, and the Warm Start Up Cost must be greater than or equal to the Hot Start Up Cost; and
 - (c) a Warm Cooling Boundary and a Hot Cooling Boundary, where the Warm Cooling Boundary duration must be greater than or equal to the Hot Cooling Boundary duration.
- D.4.3.2 A Participant shall ensure that Complex Bid Offer Data in respect of a Demand Side Unit shall include a single Shut Down Cost.
- D.4.3.3 In respect of a Pumped Storage Unit or Battery Storage Unit or Generator Unit which is Controllable and not Dispatchable and does not have Priority Dispatch, a Participant shall ensure the No Load Cost, Cold Start Up Cost, Warm Start Up Cost and Hot Start Up Cost components of Complex Bid Offer Data, including Default Data, are submitted with a value of zero.

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 (with the exception of Generator Units which are Controllable and not Dispatchable and do not have Priority Dispatch) 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.2.4 Dispatch Data

- F.2.4.1 Each System Operator shall, in accordance with the Settlement Calendar, submit to the Market Operator the Dispatch Instructions in respect of each Generator Unit which is Dispatchable (and which ~~has Priority Dispatch and is~~ Controllable and not Dispatchable where relevant) and is registered within its Jurisdiction, and shall where applicable submit an associated Dispatch Ramp Up Rate or Dispatch Ramp Down Rate for each Dispatch Instruction and may state that the Dispatch Instruction is for the purposes of All-Island Curtailment through the submission of a CURL Instruction Combination Code or Local Network Constraint through the submission of a LOCL Instruction Combination Code in accordance with Appendix O: "Instruction Profiling Calculations". Notwithstanding the precedence of the Grid Code in accordance with paragraphs B.4.1.1 and B.4.1.2, the use of these Dispatch Instructions for the purposes of this Code in accordance with Appendix O "Instruction Profiling Calculations" may be different to their use in accordance with the Grid Code.
- F.2.4.2 Each System Operator shall submit information referred to in paragraph F.2.4.1 to the Market Operator in accordance with Appendix K "Other Market Data Transactions", based on Outturn Data, and the values submitted shall be net of Unit Load.
- F.2.4.3 Except as provided in paragraph F.2.4.4(a), the Market Operator shall derive the value of the Dispatch Quantity ($q_{D_{uoh}}(t)$) for each Generator Unit, u , for each Bid Offer Acceptance, o , in Period, h , in accordance with Appendix O "Instruction Profiling Calculations".
- F.2.4.4 The Market Operator shall derive the value of the Dispatch Quantity ($q_{D_{uoh}}(t)$), for each Generator Unit, u , which has Priority Dispatch, and which is not Dispatchable (with the exception of Generator Units which are Controllable and not Dispatchable and do not have Priority Dispatch), for each Bid Offer Acceptance, o , in Period, h , as follows:
- The value shall be equal to the Final Physical Notification Quantity ($q_{FPN_{uh}}(t)$) for the Generator Unit, determined in accordance with paragraph **Error! Reference source not found.**, for each time in Period, h , where the Unit does not have a Dispatch Instruction applying to it; and
 - The Market Operator shall determine the value in accordance with paragraph F.2.4.3 for each time in respect of which a Dispatch Instruction applies to the Unit.
- F.2.4.5 The Market Operator shall derive the Dispatch Quantity ($Q_{D_{uv}}$) for each Generator Unit, u , in Imbalance Settlement Period, γ , by integrating the associated function of time Dispatch Quantity ($q_{D_{uoy}}(t)$) reflecting the last Dispatch Instruction in effect from time to time during the Imbalance Settlement Period, with respect to time across the Imbalance Settlement Period in accordance with Appendix O "Instruction Profiling Calculations".
- F.2.4.6 Each System Operator shall, in accordance with the Settlement Calendar, submit to the Market Operator the Dispatch Quantity ($q_{D_{loy}}(t)$) in respect of each Interconnector, l , which is connected to its Jurisdiction, reflecting the last Dispatch Instruction in effect from time to time during the Imbalance Settlement Period.
- F.2.4.7 The Dispatch Quantity ($q_{D_{uoy}}(t)$) for each Interconnector Residual Capacity Unit and each Interconnector Error Unit, u , reflecting the last Dispatch Instruction in effect from time to time during the Imbalance Settlement Period, shall be equal to the Dispatch Quantity of the relevant Interconnector, l .

- F.2.4.8 Each System Operator shall, in accordance with the Settlement Calendar, submit to the Market Operator the SO Interconnector Trade Quantity and Price (in the form of Accepted Bid and Offer Quantities, QAB_{uoih} , QAO_{uoih} , and Bid Offer Price, PBO_{uoih}) for each Interconnector Residual Capacity Unit, u , relevant to an Interconnector, I , which is connected to its Jurisdiction, for each Bid Offer Acceptance, o , for Band, i , in Period, h . The System Operators shall set the System Operator Flag ($FSO_{u\phi}$) for any Interconnector Residual Capacity Unit, u , equal to zero for each Imbalance Pricing Period, ϕ , in which an SO Interconnector Trade Quantity and Price is submitted.
- F.2.4.9 Each System Operator shall, in accordance with the Settlement Calendar, submit to the Market Operator the Outturn Availability Quantity ($qAVAILO_{uh}(t)$) in respect of each Generator Unit u , which is registered within its Jurisdiction, in accordance with Chapter D (Balancing Market Data Submission).

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

F.3.2 Commercial Offer Data for Calculations

- F.3.2.1 The Market Operator shall, for each Generator Unit, u , and for each Period, h , derive, from the individual sets of Incremental and Decremental Price Quantity Pairs submitted by each Participant through its Commercial Offer Data in accordance with Chapter D and adjusted by the Market Operator in accordance with paragraphs **Error! Reference source not found.**, **Error! Reference source not found.** and D.4.4.12 a set of Price Quantity Pairs for each set of Complex Bid Offer Data or Simple Bid Offer Data (as applicable), comprising a single set of Quantities each having two prices applicable (an Incremental Price and a Decremental Price), as follows:
- (a) The Quantities (q_{uih}) for the single set of Price Quantity Pairs shall be the Quantities in each set of Incremental and Decremental Price Quantity Pairs submitted by the Participant and processed by the Market Operator, ranked in order of increasing Quantity value, and assigned in this order a Band, i . For positive Quantity values, the Band, i , shall increase from zero with every Quantity increasing from zero. For negative Quantity values, the Band, i , shall decrease from zero with every Quantity decreasing from zero. For Quantities equal to zero, the Band, i , shall be zero; and
 - (b) The Incremental Price ($PINC_{uih}$) for the Quantity (q_{uih}) in the single set of Price Quantity Pairs shall be the Price from the set of Incremental Price Quantity Pairs applicable at that Quantity. The Decremental Price ($PDEC_{uih}$) for the Quantity (q_{uih}) in the single set of Price Quantity Pairs shall be the Price from the set of Decremental Price Quantity Pairs applicable at that Quantity.
- F.3.2.2 The Market Operator shall derive the Bid Offer Upper Range Quantity ($qBOUR_{uih}(t)$) and Bid Offer Lower Range Quantity ($qBOLR_{uih}(t)$) for each Generator Unit, u , for each Band, i , in each Period, h , from the sets of Price Quantity Pairs derived under paragraph F.3.2.1, as follows:
- (a) The Bid Offer Upper Range Quantity ($qBOUR_{uih}(t)$) shall be equal to the Quantity (q_{uih}) for the relevant Price Quantity Pair derived under paragraph F.3.2.1, for Band, i , where $i \geq 0$; and

- (b) The Bid Offer Lower Range Quantity ($q_{BOLR_{uih}}(t)$) shall be equal to the Quantity (q_{uih}) for the relevant Price Quantity Pair derived under paragraph F.3.2.1, for Band, i , where $i \leq 0$.

F.3.2.3 Except as provided for in paragraph F.3.2.5, the Market Operator shall derive the Bid Offer Price (PBO_{uoih}) for each Bid Offer Acceptance, o , for each Generator Unit, u , for each Band, i , in each Period, h , from the single set of Price Quantity Pairs derived under paragraph F.3.2.1, using the relevant set of Commercial Offer Data as determined in Section **Error! Reference source not found.**, as follows:

- (a) If the quantity to which the Bid Offer Price applies has a positive value, the Bid Offer Price shall be the Incremental Price ($PINC_{uih}$) of the relevant Price Quantity Pair; and
- (b) If the quantity to which the Bid Offer Price applies has a negative value, the Bid Offer Price shall be the Decremental Price ($PDEC_{uih}$) of the relevant Price Quantity Pair.

F.3.2.4 The value of the Bid Offer Price (PBO_{uoih}) for each Bid Offer Acceptance, o , for each Generator Unit, u , which has Priority Dispatch, which is not Dispatchable, and which has zero variable costs, for each Band, i , in each Period, h , shall be deemed to be zero if the quantity to which the Bid Offer Price applies is negative, with the exception of when the quantity considered is a Bid Price Only Accepted Bid Quantity in accordance with section **Error! Reference source not found.**

F.3.2.5 The value of the Bid Offer Price (PBO_{uoih}) for each Bid Offer Acceptance, o , for each Generator Unit, u , which is Controllable and not Dispatchable and does not have Priority Dispatch, for each Band, i , in each Period, h , shall be deemed to be zero if the Dispatch Instruction for o is associated with a CURL or LOCL Instruction Combination Code in accordance with Appendix O: "Instruction Profiling Calculations".

F.9 UNINSTRUCTED IMBALANCE QUANTITIES AND CHARGES

F.9.1 Setting of Uninstructed Imbalance Parameters

F.9.1.1 The following provisions of section F.9 do not apply to any Unit which is:

- (a) An Assetless Unit;
- (b) A Trading Unit;
- (c) A Generator Unit which is not Dispatchable and not Controllable; or
- (d) An Interconnector Residual Capacity Unit.

F.9.1.2 If requested by the Regulatory Authorities, the System Operators shall report to the Regulatory Authorities at least four months before the start of the Year, proposing values for the following parameters to be used in the calculation of Uninstructed Imbalances for that Year:

- (a) The Engineering Tolerance ($TOLENG_u$) (where $0 \leq TOLENG_u \leq 1$) for each Generator Unit, u ;
- (b) The MW Tolerance ($TOLMW_t$) (where $0 \leq TOLMW_t$) for each Trading Day, t ;
- (c) The System per Unit Regulation Factor (FUREG);

- (d) The Discount for Over Generation Factor ($FDOG_{uy}$) for each Generator Unit, u , in each Imbalance Settlement Period, γ , such that $0 \leq FDOG_{uy} \leq 1$; and
- (e) The Premium for Under Generation Factor ($FPUG_{uy}$) for each Generator Unit, u , in each Imbalance Settlement Period, γ , such that $0 \leq FPUG_{uy} \leq 1$.

F.9.1.3 The System Operators' report must set out any relevant research or analysis carried out by the System Operators and any 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.9.1.4 The System Operators shall, in accordance with Appendix K "Other Market Data Transactions", provide to the Market Operator at least two months prior to the start of each Year or within 5 Working Days of receipt of approval by the Regulatory Authorities, whichever is the later, the Uninstructed Imbalance Parameters Data Transaction, which comprises a complete set of Uninstructed Imbalance Parameters that have been approved by the Regulatory Authorities for that Year.

F.9.1.5 The Market Operator shall publish the approved value(s) for each Uninstructed Imbalance 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.9.2 Calculation of Uninstructed Imbalance Tolerance Quantities

F.9.2.1 The following provisions of section F.9.2 do not apply to any Unit which is an Interconnector Error Unit.

F.9.2.2 For each Trading Day, each System Operator shall submit to the Market Operator the System Characteristics Data, consisting of values of Nominal System Frequency ($FRQNOR_{\gamma}$) and Average System Frequency ($FRQAVG_{\gamma}$) for each Imbalance Settlement Period, γ , in that Trading Day, in accordance with Appendix K "Other Market Data Transactions".

F.9.2.3 The Market Operator shall calculate the Tolerance Bands for over generation and under generation for each Generator Unit for each Imbalance Settlement Period with reference to system frequency and the frequency characteristics of the Generator Unit in accordance with paragraphs F.9.2.4 and F.9.2.5.

F.9.2.4 The Market Operator shall calculate the Engineering Limit Quantity ($qLIMENG_{uy}$) for each Generator Unit, u , in each Imbalance Settlement Period, γ , as follows:

$$qLIMENG_{uy} = \text{Max} \left(\left| \frac{QD_{uy}}{DISP} \right| \times TOLENG_u, TOLMW_t \right)$$

where:

- (a) QD_{uy} is the Dispatch Quantity for Generator Unit, u , in Imbalance Settlement Period, γ ;
- (b) $TOLENG_u$ is the Engineering Tolerance for Generator Unit, u ;
- (c) $DISP$ is the Imbalance Settlement Period Duration; and

- (d) TOLMW_t is the MW Tolerance for the relevant Imbalance Settlement Period, γ, within Trading Day, t.

F.9.2.5 The Market Operator shall calculate the Tolerance for Over Generation (TOLOG_{uγ}) and Tolerance for Under Generation (TOLUG_{uγ}) as positive values, expressed in MW, for each Generator Unit, u, in each Imbalance Settlement Period, γ, as follows:

If FRQAVG_γ ≤ FRQNOR_γ, then

$$TOLOG_{u\gamma} = \left(\frac{(FRQNOR_{\gamma} - FRQAVG_{\gamma}) \times qCR_u}{FUREG \times FRQNOR_{\gamma}} \right) + qLIMENG_{u\gamma}$$

$$TOLUG_{u\gamma} = qLIMENG_{u\gamma}$$

else

$$TOLOG_{u\gamma} = qLIMENG_{u\gamma}$$

$$TOLUG_{u\gamma} = \left(\frac{(FRQAVG_{\gamma} - FRQNOR_{\gamma}) \times qCR_u}{FUREG \times FRQNOR_{\gamma}} \right) + qLIMENG_{u\gamma}$$

where:

- (a) FRQAVG_γ is the Average System Frequency in Imbalance Settlement Period, γ;
- (b) FRQNOR_γ is the Nominal System Frequency in Imbalance Settlement Period, γ;
- (c) qCR_u is the Registered Capacity of Generator Unit, u;
- (d) FUREG is the System per Unit Regulation Factor; and
- (e) qLIMENG_{uγ} is the Engineering Limit Quantity for Generator Unit, u, in Imbalance Settlement Period, γ.