

Data Validation, Consistency & Defaulting Rules

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1 Introduction

1.1 Purpose

This document defines the rules for data validation and consistency checking which are applied to Balancing Mechanism data received from Trading Agents and Control Points under the terms of the Grid Code [2]. It also covers defaulting rules to be applied in the absence of expected data. This document forms one of the Grid Code's "associated documents" and is referenced from the Grid Code [2].

The two mechanisms used for data transfer are EDT (for Trading Agents, see [3]) and EDL (for Control Points, see [4]). It should be noted that with respect to EDL, only submission messages to National Grid will be covered in this document; no information is given concerning Bid-Offer Acceptances and Ancillary Service instructions sent to Control Points.

1.2 Scope

The normal definition of terms still applies. That is, data validation is concerned with checking that data is in the correct format and within the correct limits, e.g. is it an integer, is it between given limits etc.

Data consistency concerns itself with checking if a particular data record is consistent with other data records and defaulting rules are applied in cases of missing data which should have been submitted.

Failure to comply with the validation or consistency rules will result in rejection of the submission for the BM Unit affected. Section 3 of this document details the validation checks for data submissions by EDL and EDT and section 4 the consistency checks for data submitted by these means. Section 5 details the default rules that apply where data submissions are incomplete and which are independent of the data submission method.

This document does not cover physical data formats for EDT or EDL. These issues are covered in references [3,4].

1.3 Definitions and Abbreviations

Automatic Logging Device	As defined in the Grid Code. It is instruction-receiving part of EDL
Balancing Mechanism Window	The period of time from time now to the end of the latest Settlement Period for which gate Closure has occurred.
BM Unit	Balancing Mechanism Unit
BST	British Summer Time - time set one hour ahead of Greenwich Mean Time (GMT)
CEC	Connection Entry Capacity, as defined in the CUSC
EDL	Electronic Dispatch Logging – a bi-directional message transfer mechanism. National Grid uses it to send instructions to Control Points and they use it to send BM Unit Data to National Grid. The instruction –issue/receiving part of EDL is referred to as an Automatic Logging Device (EDL) in the Grid Code, while the data submission part of EDL is referred to as Electronic Data Communication Facilities (EDL & EDT).

EDT	Electronic Data Transfer – Flat file transfer of submissions from the BM Participant to National Grid. This is referred to as Electronic Data Communication Facilities (EDL & EDT) in the Grid Code.
Gate Closure	Gate Closure for a Settlement Period is the spot time one Gate Closure Period in advance of the spot time at the start of that Settlement Period (see appendix A for further explanation)
Gate Closure Period	The Gate Closure Period is the length of time between Gate Closure and the spot time at the start of the associated Settlement Period (see appendix A for further explanation)
M	A parameter used for some of the following validation rules – initially set to 239
MEL	Maximum Export Limit
MDO	Maximum Delivery Offer
MDB	Maximum Delivery Bid
MIL	Maximum Import Limit
MNZT	Minimum Non-Zero Time
MZT	Minimum Zero Time
N	A parameter used for some of the following validation rules – set to 59
NDZ	Notice to Deviate from Zero
NETA	New Electricity Trading Arrangements
Notification Time	The time at which the transfer of a submission to the National Grid System is completed.
NTB	Notice to Deliver Bids
NTO	Notice to Deliver Offers
Operational Day	Runs from 05:00 to 05:00 local time

Submission Maximum Date	A maximum limit will be placed on the date/times allowed in a given submission. From 05:00 to 11:00 local time the Submission Maximum Date is set equal to the end of the current Operational Day + 4 days. From 11:00 to 05:00 local time the Submission Maximum Date is equal to the end of the current Operational Day + 5 days. If a single record within a submission extends beyond this date the entire submission for the BM Unit would be rejected (see appendix A for further explanation)
PN	The Physical Notification (PN) for a BM Unit is the expected level of export or import for that BM Unit in the absence of any Balancing Mechanism Bid-Offer Acceptances from ESO. The submissions of PN provided at the day-ahead stage for the following Operational Day are termed the Initial Physical Notification (IPN). It is expected that further PNs will be submitted after this time. At Gate Closure, the PN submissions applicable for the period for which the gate has closed then become the Final Physical Notification (FPN) for that period.
QPN	A Quiescent Physical Notification is a MW value expressing the level of demand expected to be consumed by an underlying process that forms part of the operation of a particular BM Unit at any particular time
RDRE	Run-down Rates for an Exporting BM Unit
RDRI	Run-down Rates for an Importing BM Unit
RURE	Run-up Rates for an Exporting BM Unit
RURI	Run-up Rates for an Importing BM Unit
SEL	Stable Export Limit
SIL	Stable Import Limit
U	A parameter used for some of the following validation rules – initially set to –99999
V	A parameter used for some of the following validation rules – initially set to 99999

The majority of the terms used here are as defined in reference 1 and 2.

1.4 Related Documents

1. Balancing and Settlement Code, Elexon.
2. The Grid Code, National Grid.



3. EDT Interface Specification, CT/24.12.0002.
4. EDL Message Specification, CT/24.13.0013.

2 Differences between EDL and EDT

The physical data formats for EDL and EDT are covered in references [3,4]. EDL is the primary mechanism by which Control Points inform NGC of changes to their operating conditions while EDT is used by Trading Agents to inform National Grid of changes to other data. As a result, the two mechanisms can have different validation and consistency rules applied to the data submitted. The following table summarises these differences.

Data Item	EDL	EDT
Physical Notifications	Not submitted by EDL	Can be submitted by EDT but only for certain date/times enforced by the rules contained in this document
Quiescent Physical Notifications	Not submitted by EDL	Can be submitted by EDT but only for certain date/times enforced by the rules contained in this document
Bid-Offer Data	Not submitted by EDL	Can be submitted by EDT but only for certain date/times enforced by the rules contained in this document
Maximum Export Limits & Maximum Import Limits	Can be submitted by EDL.	Can be submitted by EDT but only for certain date/times enforced by the rules contained in this document
Dynamic Data, i.e. SEL, SIL, RURE, RDRE, RURI, RDRI, NDZ, NTO, NTB, MZT, MNZT, MDO & MDB	Can be submitted by EDL and will be applicable from the Notification Time	Only Day Ahead Dynamic Parameters can be submitted by EDT, but they have been removed from the Grid Code and are not used by National Grid. Any Day Ahead Dynamic Parameters submitted to National Grid via EDT will be accepted by National Grid without any data validation or consistency checks.

It is also worth noting that EDL is a message based system while EDT is a file based system. As a result, data records sent via EDL are processed separately and will have distinct notification times. However data records sent via EDT are part of a single file and so will have the same notification time. The notification time is important because it determines the precedence of different submissions.

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3 Validation

3.1 Valid Date/Times

Rule Number	Description
V_GEN_1	All date/times must obey the formats given below
V_GEN_2	Any submitted date/times must be valid calendar date/times

Fields designated as date/times must be in GMT and must be to a resolution of one minute.

Rule V_GEN_2 ensures that a date such as 2000-02-31 will be rejected.

3.1.1 EDT Date/Time Formats

EDT date/time formats follow the convention

YYYY-MM-DD HH:MI

Where the following definitions apply:

YYYY	A 4 digit integer
MM	A 2 digit integer from the set {01..12}
DD	A 2 digit integer from the set {01..31}
HH	A 2 digit number from the set {00..23}
MI	A 2 digit number from the set {00..59}

3.1.2 EDL Date/Time Formats

EDL date formats follow the convention

DD-MON-YYYY HH:MI

Where the following definitions apply:

DD	A 2 digit integer from the set {01..31}
MON	From the set {JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC}
YYYY	A 4 digit integer
HH	A 2 digit number from the set {00..23}
MI	A 2 digit number from the set {00..59}

3.2 Other General Validation Rules

The following rules enforce checks on the BM Unit names and the relationship between BM Unit and Trading Agent or Control Point. Also there could be general format problems with the submitted data, meaning that validation and consistency rules cannot be applied.

Rule Number	Description
V_GEN_3	Submissions will be checked to ensure that the submitter has the right to send data for a given BM Unit
V_GEN_4	The BM Unit must have a valid name
V_GEN_5	<p>It must be possible to process a submission in order to check its validity or consistency.</p> <p>The rule covers cases where the data submission does not follow basic EDT or EDL formats and therefore cannot be checked.</p> <p>For example an EDT file could be so corrupted that individual data items may not be identifiable.</p>

3.3 Valid Physical Notifications

Physical Notifications (PN) can only be submitted via EDT, i.e. EDL does not have the capability to handle this information.

A Physical Notification record consists of the following fields.

- A date/time from.
- A PN level from (units of MW).
- A date/time to.
- A PN level to (units of MW).

Rule Number	Description
V_PN_1	A PN level must be an integer greater than or equal to –9999MW and less than or equal to the Connection Entry Capacity (CEC) of the BM Unit where such a value exists or an alternative value agreed with the Lead Party where such a value does not exist. In either case, the Lead Party may from time to time choose to submit alternative lower values to validate against.
V_PN_2	Null fields are not allowed
V_PN_3	A Physical Notification “date/time from” must be earlier than its “date/time to”
V_PN_4	The Physical Notification “date/time from” field must be later than or equal to the end of the Balancing Mechanism Window.
V_PN_5	The Physical Notification “date/time to” field must be earlier than or equal to the Submission Maximum Date

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MW levels for exporters of power would be expected to be positive. MW levels for importers of power would be expected to be negative.

3.4 Valid Quiescent Physical Notifications

Quiescent Physical Notifications (QPN) can only be submitted via EDT, i.e. EDL does not have the capability to handle this information.

A quiescent physical notification record consists of the following fields.

- A date/time from.
- A QPN level from (units of MW).
- A date/time to.
- A QPN level to (units of MW).

Rule Number	Description
V_QPN_1	A QPN level must be an integer greater than or equal to -9999MW and less than or equal to 0MW
V_QPN_2	Null fields are not allowed
V_QPN_3	A Quiescent Physical Notification "date/time from" must be earlier than its "date/time to"
V_QPN_4	The Quiescent Physical Notification "date/time from" field must be later than or equal to the end of the Balancing Mechanism Window
V_QPN_5	The Quiescent Physical Notification "date/time to" field must be earlier than or equal to the Submission Maximum Date

From the ranges allowed for QPN levels it can be deduced that only importers of power are expected to submit non-zero values for Quiescent Physical Notifications.

3.5 Valid Bid-Offer Data

Bid-offer data can only be submitted via EDT, i.e. EDL does not have the capability to handle this information.

A bid-offer record consists of the following fields.

- A date/time from.
- A date/time to.
- A bid-offer pair number.
- A bid-offer level from (units of MW).
- A bid-offer level to (units of MW).
- An offer price (units of £/MWh).
- A bid price (units of £/MWh).

Rule Number	Description
V_BOD_1	The fields “date/time from” and “date/time to” must correspond to settlement half hour period boundaries
V_BOD_2	The field “date/time from” must be earlier than the field “date/time to”
V_BOD_3	The “bid-offer pair number” must be an integer greater than or equal to –5 and less than or equal to 5 <u>BUT must not have the value 0</u>
V_BOD_4	The fields “bid-offer level from” and “bid-offer level to” must be an integer greater than or equal to –9999MW and less than or equal to 9999MW
V_BOD_5	The fields “bid-offer level from” and “bid-offer level to” must be equal
V_BOD_6	<p>If the “bid-offer pair number” is positive then the values of the fields “bid-offer level from” and “bid-offer level to” must also be positive or zero.</p> <p>If the “bid-offer pair number” is negative then the values of the fields “bid-offer level from” and “bid-offer level to” must also be negative or zero.</p>
V_BOD_7	Null fields are not allowed
V_BOD_8	All “offer prices” and “bid prices” must be a real number, accurate to 2 decimal places, which must be greater than or equal to – 99999.00 £/MWh and less than or equal to 99999.00 £/MWh
V_BOD_9	The bid-offer “date/time from” field must be later than or equal to the end of the Balancing Mechanism Window
V_BOD_10	The bid-offer “date/time to” field must be earlier than or equal to the Submission Maximum Date
V_BOD_11	Bid Offer Data can only be submitted in respect of BM Units which have an Automatic Logging Device

3.6 Valid Maximum Export Limits

A Maximum Export Limit (MEL) record consists of the following fields.

- A date/time from.

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- A MEL level from (units of MW).
- A date/time to.
- A MEL level to (units of MW).

Rule Number	Description
V_MEL_1	The fields “MEL level from” and “MEL level to” must be integers greater than or equal to 0MW and less than or equal to 9999MW
V_MEL_2	Null fields are not allowed
V_MEL_3	The field “date/time from” must be earlier than the field “date/time to”
V_MEL_4	If the submission has been received via EDT then the MEL “date/time from” field must be later than or equal to the end of Balancing Mechanism Window.
V_MEL_5	The MEL “date/time to” field must be earlier than or equal to the Submission Maximum Date
V_MEL_6	The MEL “date/time from” field must be later than or equal to the Notification Time.

3.7 Valid Maximum Import Limits

A Maximum Import Limit (MIL) record consists of the following fields.

- A date/time from.
- A MIL level from (units of MW).
- A date/time to.
- A MIL level to (units of MW).

Rule Number	Description
V_MIL_1	The fields “MIL level from” and “MIL level to” must be integers greater than or equal to – 9999MW and less than or equal to 0MW
V_MIL_2	Null fields are not allowed
V_MIL_3	The field “date/time from” must be earlier than the field “date/time to”
V_MIL_4	If the submission has been received via EDT then the MIL “date/time from” field must be later than or equal to the end of the Balancing Mechanism Window
V_MIL_5	The MIL “date/time to” field must be earlier than or equal to the Submission Maximum Date.

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Rule Number	Description
V_MIL_6	The MIL "date/time from" field must be later than or equal to the Notification Time.

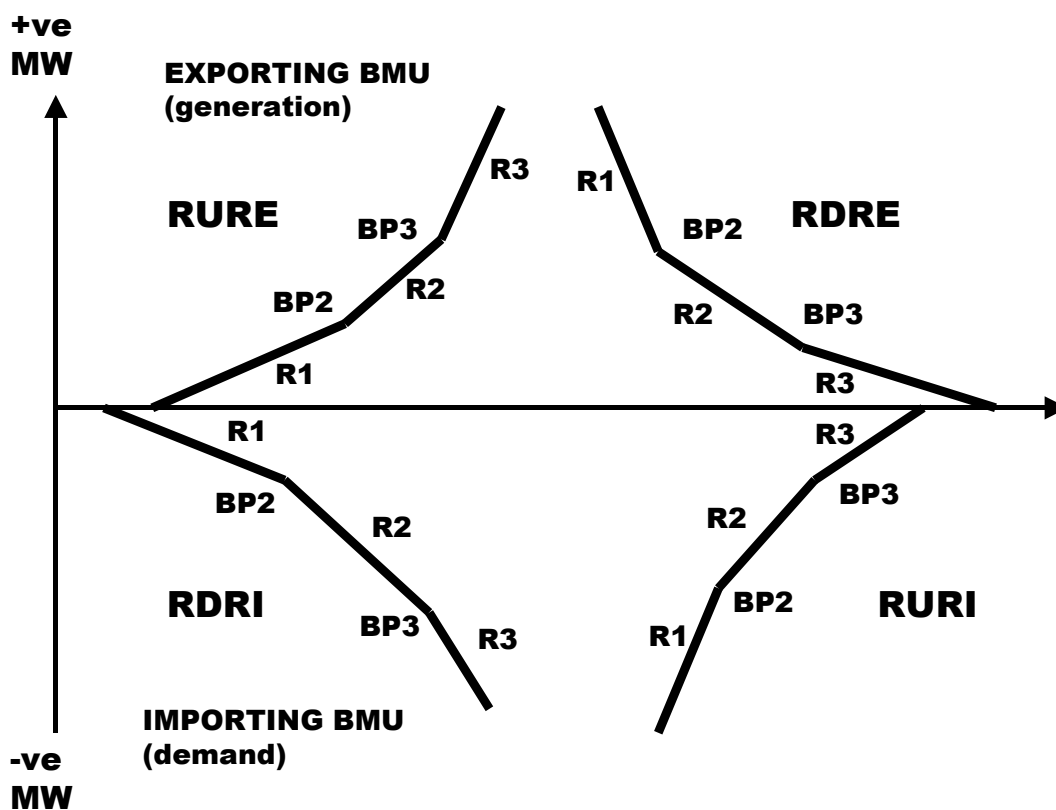
3.8 Valid Run-up and Run-down Rates

Submissions can be made for run-up and run-down rates which correspond to changes in the production and consumption of power. Hence a given BM Unit can have four sets of rates and breakpoints in the following way.

- A set of parameters describing run-up rates when exporting.
- A set of parameters describing run-down rates when exporting.
- A set of parameters describing run-up rates when importing.
- A set of parameters describing run-down rates when importing.

Reference 1 uses the abbreviation ^gRUR and ^gRUE for the run-up rates and the elbow points for a given BM Unit. The ^g superscripts for the run-up dynamics of an exporting BM Unit are described in detail but the use of this superscript for an importing BM Unit is less well defined (there is a simple statement that in this case ^g will be less than zero). Similar abbreviations are proposed for run-down dynamics.

It has proved very difficult to use the proposed negative ^g superscripts in a logical way and as a result this document deviates from the proposal in reference 1 and will instead use the abbreviations given below.



3.8.1 Valid Run-up Rates for an Exporting BM Unit

A record for the Run-up Rates of an Exporting BM Unit (RURE) consists of the following fields.

- First Run-up Rate (abbreviation RURE_R1, units MW/minute).
- Second Run-up Rate Breakpoint (abbreviation RURE_BP2, units MW).
- Second Run-up Rate (abbreviation RURE_R2, units MW/minute).
- Third Run-up Rate Breakpoint (abbreviation RURE_BP3, units MW).
- Third Run-up Rate (abbreviation RURE_R3, units MW/minute).

Rule Number	Description
V_RURE_2	<p>The following are the only valid combinations of rates and breakpoint fields allowed</p> <p><u>1st valid combination</u></p> <p>RURE_R1 = NOT NULL RURE_BP2 = NULL RURE_R2 = NULL RURE_BP3 = NULL RURE_R3 = NULL</p> <p><u>2nd valid combination</u></p> <p>RURE_R1 = NOT NULL RURE_BP2 = NOT NULL RURE_R2 = NOT NULL RURE_BP3 = NULL RURE_R3 = NULL</p> <p><u>3rd valid combination</u></p> <p>RURE_R1 = NOT NULL RURE_BP2 = NOT NULL RURE_R2 = NOT NULL RURE_BP3 = NOT NULL RURE_R3 = NOT NULL</p>
V_RURE_3	If a run-up rate field is not null it must be a real number, accurate to 1 decimal place, greater than or equal to 0.2MW/minute and less than or equal to 999.0MW/minute.
V_RURE_4	If a run-up rate breakpoint field is not null it must be an integer greater than or equal to 1MW and less than or equal to 9999MW

Rule Number	Description
V_RURE_5	If both run-up rate breakpoints are not null then the field "Second Run-up Rate Breakpoint" must be less than the field "Third Run-up Rate Breakpoint"

3.8.2 Valid Run-down Rates for an Exporting BM Unit

A record for the Run-down Rates of an Exporting BM Unit (RDRE) consists of the following fields.

- First Run-down Rate (abbreviation RDRE_R1, units MW/minute).
- Second Run-down Rate Breakpoint (abbreviation RDRE_BP2, units MW).
- Second Run-down Rate (abbreviation RDRE_R2, units MW/minute).
- Third Run-down Rate Breakpoint (abbreviation RDRE_BP3, units MW).
- Third Run-down Rate (abbreviation RDRE_R3, units MW/minute).

Rule Number	Description
V_RDRE_2	<p>The following are the only valid combinations of rates and breakpoint fields allowed</p> <p><u>1st valid combination</u></p> <p>RDRE_R1 = NOT NULL</p> <p>RDRE_BP2 = NULL</p> <p>RDRE_R2 = NULL</p> <p>RDRE_BP3 = NULL</p> <p>RDRE_R3 = NULL</p> <p><u>2nd valid combination</u></p> <p>RDRE_R1 = NOT NULL</p> <p>RDRE_BP2 = NOT NULL</p> <p>RDRE_R2 = NOT NULL</p> <p>RDRE_BP3 = NULL</p> <p>RDRE_R3 = NULL</p> <p><u>3rd valid combination</u></p> <p>RDRE_R1 = NOT NULL</p> <p>RDRE_BP2 = NOT NULL</p> <p>RDRE_R2 = NOT NULL</p> <p>RDRE_BP3 = NOT NULL</p> <p>RDRE_R3 = NOT NULL</p>

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Rule Number	Description
V_RDRE_3	If a run-down rate field is not null it must be a real, accurate to 1 decimal place, greater than or equal to 0.2MW/minute and less than or equal to 999.0MW/minute.
V_RDRE_4	If a run-down rate breakpoint field is not null it must be an integer greater than or equal to 1MW and less than or equal to 9999MW
V_RDRE_5	If both run-down rate breakpoints are not null then the field "Second Run-down Rate Breakpoint" must be greater than the field "Third Run-down Rate Breakpoint"

3.8.3 Valid Run-up Rates for an Importing BM Unit

A record for the Run-up Rates of an Importing BM Unit (RURI) consists of the following fields.

- First Run-up Rate (abbreviation RURI_R1, units MW/minute).
- Second Run-up Rate Breakpoint (abbreviation RURI_BP2, units MW).
- Second Run-up Rate (abbreviation RURI_R2, units MW/minute).
- Third Run-up Rate Breakpoint (abbreviation RURI_BP3, units MW).
- Third Run-up Rate (abbreviation RURI_R3, units MW/minute).

Rule Number	Description

Rule Number	Description
V_RURI_2	<p>The following are the only valid combinations of rates and breakpoint fields allowed</p> <p><u>1st valid combination</u></p> <p>RURI_R1 = NOT NULL RURI_BP2 = NULL RURI_R2 = NULL RURI_BP3 = NULL RURI_R3 = NULL</p> <p><u>2nd valid combination</u></p> <p>RURI_R1 = NOT NULL RURI_BP2 = NOT NULL RURI_R2 = NOT NULL RURI_BP3 = NULL RURI_R3 = NULL</p> <p><u>3rd valid combination</u></p> <p>RURI_R1 = NOT NULL RURI_BP2 = NOT NULL RURI_R2 = NOT NULL RURI_BP3 = NOT NULL RURI_R3 = NOT NULL</p>
V_RURI_3	If a run-up rate field is not null it must be a real number, accurate to 1 decimal place, greater than or equal to 0.2MW/minute and less than or equal to 999.0MW/minute.
V_RURI_4	If a run-up rate breakpoint field is not null it must be an integer greater than or equal to -9999MW and less than or equal to -1MW
V_RURI_5	If both run-up rate breakpoints are not null then the field "Second Run-up Rate Breakpoint" must be less than the field "Third Run-up Rate Breakpoint"

3.8.4 Valid Run-down Rates for an Importing BM Unit

A record for the Run-down Rates of an Importing BM Unit (RDRI) consists of the following fields.

- First Run-down Rate (abbreviation RDRI_R1, units MW/minute).
- Second Run-down Rate Breakpoint (abbreviation RDRI_BP2, units MW).

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- Second Run-down Rate (abbreviation RDRI_R2, units MW/minute).
- Third Run-down Rate Breakpoint (abbreviation RDRI_BP3, units MW).
- Third Run-down Rate (abbreviation RDRI_R3, units MW/minute).

Rule Number	Description
V_RDRI_2	<p>The following are the only valid combinations of rates and breakpoint fields allowed</p> <p><u>1st valid combination</u></p> <p>RDRI_R1 = NOT NULL RDRI_BP2 = NULL RDRI_R2 = NULL RDRI_BP3 = NULL RDRI_R3 = NULL</p> <p><u>2nd valid combination</u></p> <p>RDRI_R1 = NOT NULL RDRI_BP2 = NOT NULL RDRI_R2 = NOT NULL RDRI_BP3 = NULL RDRI_R3 = NULL</p> <p><u>3rd valid combination</u></p> <p>RDRI_R1 = NOT NULL RDRI_BP2 = NOT NULL RDRI_R2 = NOT NULL RDRI_BP3 = NOT NULL RDRI_R3 = NOT NULL</p>
V_RDRI_3	If a run-down rate field is not null it must be a real, accurate to 1 decimal place, greater than or equal to 0.2MW/minute and less than or equal to 999.0MW/minute.
V_RDRI_4	If a run-down rate breakpoint field is not null it must be an integer greater than or equal to -9999MW and less than or equal to -1MW
V_RDRI_5	If both run-down rate breakpoints are not null then the field "Second Run-up Rate Breakpoint" must be greater than the field "Third Run-up Rate Breakpoint"

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3.9 Valid Notice to Deviate from Zero

A Notice to Deviate from Zero (NDZ) record consists of the following field.

- An NDZ value (units of minutes).

Rule Number	Description
V_NDZ_2	The field "NDZ value" cannot be null and must be an integer greater than or equal to 0 minutes and less than or equal to 999 minutes

3.10 Valid Notice to Deliver Offers

A Notice to Deliver Offers (NTO) record consists of the following field.

- An NTO value (units of minutes).

Rule Number	Description
V_NTO_2	The field "NTO value" cannot be null and must be an integer greater than or equal to 0 minutes and less than or equal to N minutes

3.11 Valid Notice to Deliver Bids

A Notice to Deliver Bids (NTB) record consists of the following field.

- An NTB value (units of minutes).

Rule Number	Description
V_NTB_2	The field "NTB value" cannot be null and must be an integer greater than or equal to 0 minutes and less than or equal to N minutes

3.12 Valid Minimum Zero Time

A Minimum Zero Time (MZT) record consists of the following field.

- An MZT value (units of minutes).

Rule Number	Description

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Rule Number	Description
V_MZT_2	The field “MZT value” cannot be null and must be an integer greater than or equal to 0 minutes and less than or equal to 999 minutes

3.13 Valid Minimum Non-Zero Time

A Minimum Non-zero Time (MNZT) record consists of the following field.

- An MNZT value (units of minutes).

Rule Number	Description
V_MNZT_2	The field “MNZT value” cannot be null and must be an integer greater than or equal to 0 minutes and less than or equal to 999 minutes

3.14 Valid Stable Export Limit

A Stable Export Limit (SEL) record consists of the following fields.

- An effective time (EDT submissions use this field - the concept does not exist in EDL).
- An SEL value (units of MW).

Rule Number	Description
V_SEL_1	The “effective time” field is only relevant to EDT submissions and can only have a value corresponding to the start date/time of a future Operational Day (note times are in GMT). The “effective time” cannot be later than the Submission Maximum Date. If the field has a valid Operational Day start date/time then this submission will only be used for planning purposes.
V_SEL_2	The field “SEL value” cannot be null and must be an integer greater than or equal to 0MW and less than or equal to 9999MW

3.15 Valid Stable Import Limit

A Stable Import Limit (SIL) record consists of the following field.

- An SIL value (units of MW).

Rule Number	Description

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Rule Number	Description
V_SIL_2	The field "SIL value" cannot be null and must be an integer greater than or equal to -9999MW and less than or equal to 0MW

3.16 Valid Maximum Delivery Offer

A Maximum Delivery Offer (MDO) record consists of the following fields.

- A date/time from.
- A MDO level from (units of MWh).
- A date/time to.
- A MDO level to (units of MWh).

Rule Number	Description
V_MDO_1	The fields "MDO level from" and "MDO level to" must be integers greater than or equal to 0MWh and less than or equal to 9999MWh
V_MDO_2	Null fields are not allowed
V_MDO_3	The field "date/time from" must be earlier than the field "date/time to"
V_MDO_4	The MDO "date/time to" field must be earlier than or equal to the Submission Maximum Date
V_MDO_5	The MDO "date/time from" field must be later than or equal to the Notification Time.

3.17 Valid Maximum Delivery Bid

A Maximum Delivery Bid (MDB) record consists of the following fields.

- A date/time from.
- A MDB level from (units of MWh).
- A date/time to.
- A MDB level to (units of MWh).

Rule Number	Description
V_MDB_1	The fields "MDB level from" and "MDB level to" must be integers greater than or equal to -9999MWh and less than or equal to 0MWh
V_MDB_2	Null fields are not allowed
V_MDB_3	The field "date/time from" must be earlier than the field "date/time to"

ESO

Rule Number	Description
V_MDB_4	The MDB "date/time to" field must be earlier than or equal to the Submission Maximum Date.
V_MDB_5	The MDB "date/time from" field must be later than or equal to the Notification Time.

ESO

4 Consistency

4.1 Physical Notification Consistency Rules

Physical Notification records are submitted via EDT flat files. Within an EDT file there is no implied ordering and as a result records for the same BM Unit cannot cover the same time period. If the records did cover the same time period it would be impossible to determine which record took precedence.

There is also a requirement that a Physical Notification for a given BM Unit must be submitted for every half hour period start “date/time” covered by the submission and that the records submitted must cover complete half hour periods. For example the following combination of to and from date/times is acceptable

“from date/time”	“to date/time”
2000-02-07 10:00	2000-02-07 10:15
2000-02-07 10:15	2000-02-07 10:30
2000-02-07 10:30	2000-02-07 11:00

However this combination

“from date/time”	“to date/time”
2000-02-07 10:00	2000-02-07 10:15
2000-02-07 10:16	2000-02-07 10:31
2000-02-07 10:31	2000-02-07 10:59

will fail consistency checking because there is a gap in the records between 10:15 and 10:16, the record starting at 10:16 and extending to 10:31 goes beyond the settlement half hour end time of 10:30, there is no record corresponding to the settlement period start of 10:30, and there is a gap between 10:59 and the end of the settlement period given by 11:00.

Rule Number	Description
C_PN_1	Physical Notification records, for the same BM Unit, with the same Notification Time must cover distinct time ranges.
C_PN_2	Physical Notification records, for the same BM Unit, with the same Notification Time must cover complete settlement half hour periods. In addition a sub-set of the records must have “date/time” fields corresponding to the start of each half hour period covered.

ESO

4.2 Quiescent Physical Notification Rules

The clarification comments given in section 4.1 for physical notifications are equally applicable to quiescent physical notifications.

Rule Number	Description
C_QPN_1	Quiescent Physical Notification records, for the same BM Unit, with the same Notification Time must cover distinct time ranges.
C_QPN_2	Quiescent Physical Notification records, for the same BM Unit, with the same Notification Time must cover complete settlement half hour periods. In addition a sub-set of the records must have "date/time" fields corresponding to the start of each half hour period covered.

4.3 Bid-offer Consistency Rules

A bid-offer set is defined as those bid-offer records, for a given BM Unit, that have the same Notification Times, the same "date/time from" fields, and the same "date/time to" fields.

Rule Number	Description
C_BOD_1	Bid-offer sets must cover distinct time ranges.
C_BOD_2	For a given bid-offer set "offer prices" submitted must not decrease as the values of the "bid-offer pair number" increases, i.e. prices must be monotonically non-decreasing
C_BOD_3	For a given bid-offer set "bid prices" submitted must not decrease as the values of the "bid-offer pair number" increases, i.e. prices must be monotonically non-decreasing
C_BOD_4	Each bid-offer set must contain bid-offer records corresponding to the "bid-offer pair numbers" +1 and -1 and for a given bid-offer set the "bid-offer pair numbers" must be continuous (with the exception that 0 is not an allowed value).
C_BOD_5	For a given bid-offer set the "offer price" must be equal to or greater than the "bid price" for each individual "bid-offer pair number".

ESO

Rule Number	Description
C_BOD_6	For a given bid-offer set, the fields “bid-offer level from” and “bid-offer level to”, for all bid-offer pairs other than the pair with the highest positive “bid-offer pair number” and the pair with the lowest negative “bid-offer pair number”, must not be zero.

4.4 Maximum Export Limit Consistency Rules

Rule Number	Description
C_MEL_1	Maximum Export Limit records, for the same BM Unit, with the same Notification Time must cover distinct time ranges.

4.5 Maximum Import Limit Consistency Rules

Rule Number	Description
C_MIL_1	Maximum Import Limit records, for the same BM Unit, with the same Notification Time must cover distinct time ranges.

ESO

5 Defaults

5.1 Default Data

It should be noted that, in general, if defaulted data is not overwritten by subsequent submissions it will become operational data.

There is a single defaulting rule for Bid-Offer Data. However, for Physical Notifications, Quiescent Physical Notifications, Maximum Export Limit and Minimum Import Limit, there are two different defaulting rules available. For each BM Unit and all relevant data types only one rule will be applied. In the absence of any request to apply a specific rule for any BM Unit data, the first rule (C) will be applied as a matter of course., unless it relates to an External Interconnection, in which case the second rule (Z) will in the absence of any such request apply. The decision as to which rule can be applied to a specific BM Unit and data type is the responsibility of the System Operator.

Data defaulting is applied where the submitted data is not complete for any Operational Day at the relevant time. For example, at 1999-12-06 11:00 if there were a gap in data covering a period from 1999-12-07 13:00 to 1999-12-07 14:00 (that is in the following Operational Day) then default data would be generated to fill the gap. Using the first rule, the data from 1999-12-06 13:00 to 1999-12-06 14:00 would be copied to fill the gap. This data would include all updates that had been made up to 1999-12-06 11:00 for that time period. Using the second rule this gap would be filled with zero level data.

5.2 Defaulting and Clock change Days

For real-time systems operating twenty-four hours per day in local time, an issue exists with duplicated and missing hours as local time changes between time standards. In general, the clock change occurs in the early hours (at 01:00 GMT) on a Sunday. The nature of the Operational Day (05:00 to 05:00 local time) means that the clock change occurs towards the end of the Saturday Operational Day. As a result of the clock change, a Short Day (23hrs) occurs in spring and a Long Day (25hrs) occurs in autumn.

On the basis of these assumptions, the following table describes the mechanism used to generate default data where gaps exist in the data submitted. The table defines the mechanism for each of the Operational Days before, during and after each clock change. The last column defines, for each day, the source of data for any gaps in that Operational Day for which defaulting is done. Note that all times shown in the table are in local time.

The method adopted preserves the local time profiles for data from Operational Days before to those after the Operational Day in which the clock change falls. However, on the clock change Operational Days themselves, there is a shift in data for part of the day. In the case of the spring clock change, periods after the clock change are shifted one hour later according to local time. In the case of the autumn clock change, periods before the clock change are shifted one hour later according to local time.

Clock Change	Operational Day	Day Type	When Defaulted	Default Mechanism
Spring	Friday	GMT	11:00 Thursday	Copy data from period 24 hours earlier
	Saturday	Short Day	11:00 Friday	Copy data from period 24 hours earlier

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	Sunday	BST	11:00 Saturday	For periods from 05:00 to 04:00: Copy data from period 23 hours earlier For periods from 04:00 to 05:00: Copy data from period 47 hours earlier
Autumn	Friday	BST	11:00 Thursday	Copy data from period 24 hours earlier
	Saturday	Long Day	11:00 Friday	Copy data from period 25 hours earlier
	Sunday	GMT	11:00 Saturday	Copy data from period 24 hours earlier

5.3 Default Rule for Physical Notifications

Rule Number	Description
C	If no Physical Notification submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Physical Notification submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day.

N.B. Either C or Z will be applied for each BM Unit.

5.4 Default Rule for Quiescent Physical Notifications

Rule Number	Description
C	If no Quiescent Physical Notification submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Quiescent Physical Notification submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day.

N.B. Either C or Z will be applied for each BM Unit.

ESO

5.5 Default Rule for Maximum Export Limit

Rule Number	Description
C	If no Maximum Export Limit submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Maximum Export Limit submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day

N.B. Either C or Z will be applied for each BM Unit.

5.6 Default Rule for Maximum Import Limit

Rule Number	Description
C	If no Maximum Import Limit submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Maximum Import Limit submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day

N.B. Either C or Z will be applied for each BM Unit.

5.7 Default Rules for Bid-Offer Data

Rule Number	Description
BOD	If no bid-offer submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.

5.8 Default Rule for Maximum Delivery Offer

Rule Number	Description
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ESO

C	If no Maximum Delivery Offer submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Maximum Delivery Offer submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day

N.B. Either C or Z will be applied for each BM Unit.

5.9 Default Rule for Maximum Delivery Bid

Rule Number	Description
C	If no Maximum Delivery Bid submission, or a partial submission, has been made by 11:00 the data for the current Operational Day will be copied forward to fill gaps in the next Operational Day.
Z	If no Maximum Delivery Bid submission, or a partial submission, has been made by 11:00 a zero profile will be applied to fill gaps in data for the next Operational Day

N.B. Either C or Z will be applied for each BM Unit.

6 Initial Data

When a BM unit is first registered with Elexon and setup, by NGC, within the BM a set of initial values for each of the submitted data items is given. These values are used in the absence of a submission from the responsible Trading Point/Control Point.

The following values are used for the following data types:

- MEL, PN, QPN, MIL, SEL, SIL, MZT & MNZT are all zero.
- Bid-Offer Volume, Bid Price and Offer Price are all zero for all initial settlement periods up to the end of the next Operational Day.
- RURE, RDRE, RURI & RDRI is 10.
- MDO is 9999
- MDB is -9999
- NDZ, NTO & NTB is 2

There are no initial data values populated for a BM Unit when it is first registered with National Grid. Instead, once the BM Unit has been registered with National Grid. Instead, for those BM Units that wish to actively participate in the Balancing Mechanism, the associated Trading Point/Control Point should submit appropriate values using the communication methods specified in Grid Code BC1.4.1(a) [2].



APPENDIX A: CLARIFICATION OF GATE CLOSURE AND SUBMISSION MAXIMUM DATE

The concepts of Gate Closure and Submission Maximum Date are used throughout this document and are of central importance when applying some of the rules given. This appendix expands the explanations given in section 1.3.

Data submitted is time stamped with the time when a transfer to the NGC system is complete – this is known as the Notification Time. This Notification Time is used to define Gate Closure and the Submission Maximum Date for the data within the submission.

A.1 Gate Closure

As an example of Gate Closure and the Gate Closure Period consider a submission which has a Notification Time of 2000-03-03 10:00. Consider how the validation rule V_PN_4 would be applied. This rule states that the Physical Notification “date/time from” field must be later than or equal to the end of the last Settlement Period for which Gate Closure has occurred at the Notification Time.

For this Notification Time the last Gate Closure occurred at 2000-03-03 10:00. We take the Gate Closure Period as 1 hour. This latest Gate Closure therefore occurs for the Settlement Period commencing one hour after this time, i.e. 2000-03-03 11:00. Thus, the end of the Settlement Period for which Gate Closure has occurred is 2000-03-03 11:30. As a result all Physical Notifications in this submission must have a “date/time from” field with date/times later than or equal to 2000-03-03 11:30.

Because Gate Closure is always on a half-hour period the same date/times apply for submissions with Notification Times up to 2000-03-03 10:30. So if a submission had a Notification Time of 2000-03-03 10:29 the values quoted in the last paragraph would still apply.

However for a submission with a Notification Time of 2000-03-03 10:30, the most recent Gate Closure would be at 2000-03-03 10:30 and all times quoted above would increase by 30 minutes.

A.2 Submission Maximum Date

The following tables provide examples of the calculation of the Submission Maximum Date.

Note that Notification Times and the Submission Maximum Date should be used in the GMT time convention as they relate to data in a submission which is always in GMT.

However it is easier to think in local time and then convert to GMT because the concept of a Submission Maximum Date is related to the Operational Day which runs from 05:00 to 05:00 local time.

The following table gives examples of the calculation of the Submission Maximum Date over a spring clock change on 2000-03-26.



Notification Times			Days Added	Submission Maximum Date		
Date	Local Time	GMT		Date	Local Time	GMT
2000-03-20	10:59	10:59	4	2000-03-25	05:00	05:00
2000-03-20	11:00	11:00	5	2000-03-26	05:00	04:00
2000-03-24	03:59	03:59	5	2000-03-29	05:00	04:00
2000-03-24	04:00	04:00	5	2000-03-29	05:00	04:00
2000-03-24	04:59	04:59	5	2000-03-29	05:00	04:00
2000-03-24	05:00	05:00	4	2000-03-29	05:00	04:00
2000-03-24	10:59	10:59	4	2000-03-29	05:00	04:00
2000-03-24	11:00	11:00	5	2000-03-30	05:00	04:00
2000-03-25	03:59	03:59	5	2000-03-30	05:00	04:00
2000-03-25	04:00	04:00	5	2000-03-30	05:00	04:00
2000-03-25	04:59	04:59	5	2000-03-30	05:00	04:00
2000-03-25	05:00	05:00	4	2000-03-30	05:00	04:00
2000-03-25	10:59	10:59	4	2000-03-30	05:00	04:00
2000-03-25	11:00	11:00	5	2000-03-31	05:00	04:00
2000-03-26	03:59	02:59	5	2000-03-31	05:00	04:00
2000-03-26	04:00	03:00	5	2000-03-31	05:00	04:00
2000-03-26	04:59	03:59	5	2000-03-31	05:00	04:00
2000-03-26	05:00	04:00	4	2000-03-31	05:00	04:00
2000-03-26	10:59	09:59	4	2000-03-31	05:00	04:00
2000-03-26	11:00	10:00	5	2000-04-01	05:00	04:00

DOCUMENT STATUS

Template Version 3.0

PRODUCT DESCRIPTION REFERENCE

IS/24.22.0023

AMENDMENT RECORD

Issue	Draft	Date	Author	Description of changes
10	4	24/09/24	MBD	After internal review – for sharing with WG
10	3	21/09/24	MBD	Changes for MDO and MDB
10	2	19/03/24		Removal of changes for EBS and updated branding
9		14/07/16	SCR	Changes for EBS – issue not adopted
9		14/07/16	SCR	Authority approval of Issue 9 draft 5 changes
9	5	24/01/14	RJP	Updated following comments from GC0068 Consultation review
9	4	31/10/13	RJP	Updated following comments from GCRP members in preparation for industry consultation
9	3	11/10/13	RJP	Updated following review at the EBSG Workgroup for circulation to GCRP for comments
9	2	18/09/13	RJP	Updated following internal review for circulation to EBSG Workgroup
9	1	23/08/13	RJP	Changes for EBS including adding the section on EDT*
8	3	25/01/12	RDG	Add validation rule D_BOD_2; update introduction. Update initial NDZ to 2 minutes in line with NTO & NTB
8	2	2/11/11	RDG	Updates after review Update value for N
8	1	24/10/11	RDG	Add validation rule V_BOD_11

				Add Section 6: Initial values
7		11/10/04	PH	Authority approval of Issue 7 draft 1 changes
7	1	3/11/03	PH	Replace Generation Capacity with Connection Entry Capacity or equivalent.
6		25/05/04	RDG	Authority approval of Issue 6 draft 1 changes
6	1	19/11/02	RDG	Introduce D_PN_2, D_QPN_1, D_MEL_1, D_MIL_1 as alternative rules for data defaulting. Modify Gate Closure parameter from 3.5 to 1 hours
5		19/12/00	DJB	Include comments from internal review.
5	1	06/12/00	DJB	Include notes on how clock change affects defaulting rules and other clarifications. Removed rules: D_BOD_2; D_BOD_3; D_BOD_4. NGC Events: 2540, 2539, 2744
4		24/05/00	JMW	Included comments from internal reviews. Added new rule C_BOD_6. Added clarification for rule V_GEN_5 and V_BOD_6
4	1	17/05/00	MBD	Included new rules V_GEN_5, V_MEL_6 and V_MIL_6. Added clarification for rule C_BOD_4.
3		14/03/00	MBD	Final comments included before issued
2		10/02/00	MBD	Final changes before release to PDO
1		28/01/00	MBD	Included final internal review comments