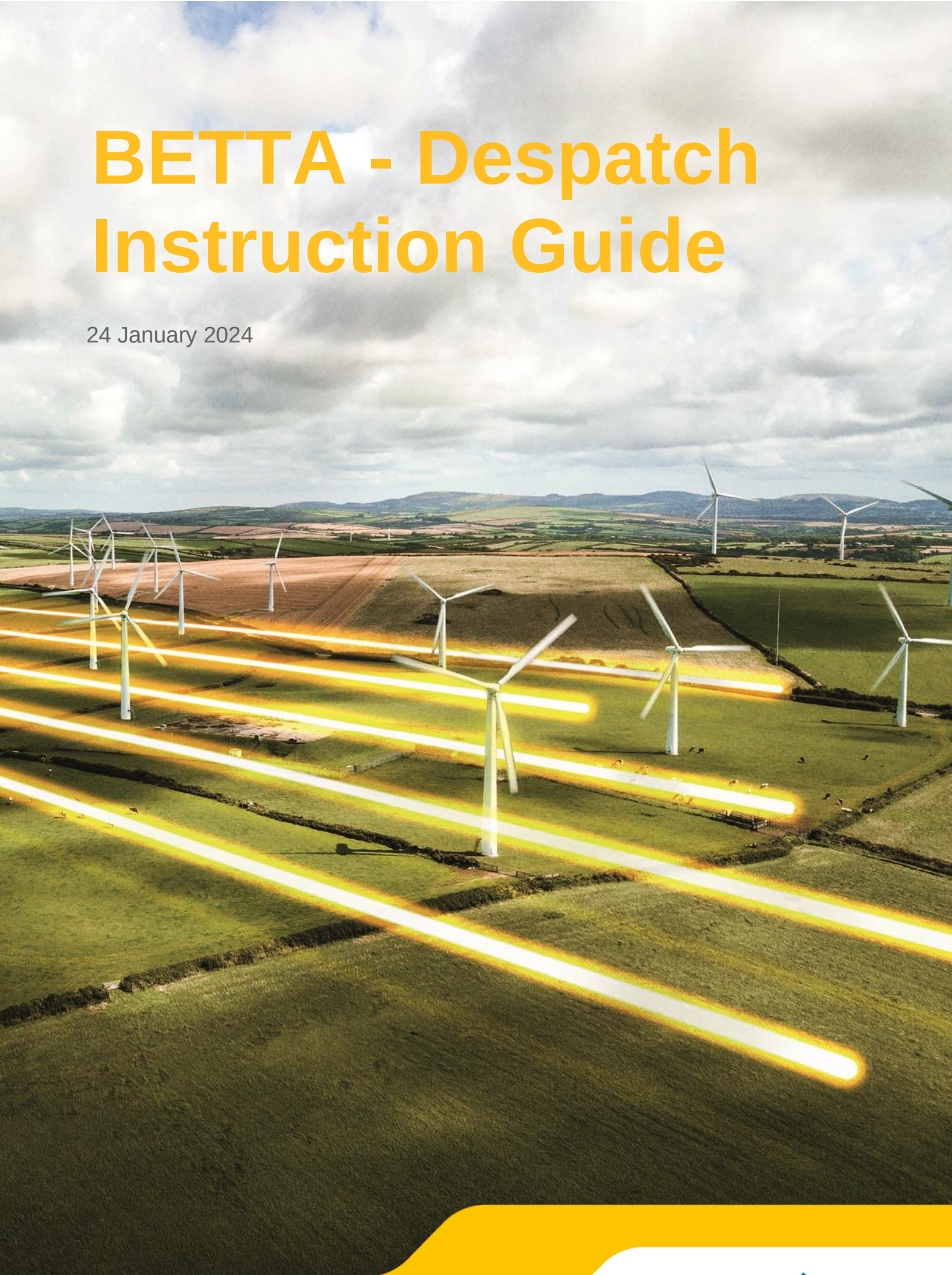
BETTA - Despatch Instruction Guide

24 January 2024



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Contents

1. Introduction

1.1 Overview

This document covers the electronic logging of despatch instructions. Examples are

given of how the instructions are interpreted in the Balancing Mechanism (BM) Window.

The important points that are covered in this document include:

- Bid Offer Acceptances (BOAs) can only apply within the BM Window.
- BOAs will be issued as closed instructions. The length of the instruction shall be user editable, after which time the unit shall ramp back to the capped committed profile or be closed at the end of the BM Window.
- BOAs do not need to form a consecutive profile for a unit's output. i.e. a BOA does not need to start from the time and MW level that the previous BOA ended.
- Frequency response instructions are open ended non-BM trades without target MW levels.
- The electronic Instruction Logger will record BOA, Ancillary Service Information and contracted static reactive power services instructions.

2. Instructions in the BETTA environment

2.1 Background

The British Electricity Trading and Transmission Arrangements (BETTA) require Balancing Mechanism Units to submit a Physical Notification (PN) of expected generation. The BMU will be expected to follow the PN without an instruction from NGESO. This means the majority of BMUs will be generating without having been issued an instruction; they will be expected to follow their Physical Notification position. NGESO will issue Offer or Bid Acceptances to BMUs to deviate from their PN position (other than plant breakdown). This will allow NGESO to balance generation and demand in real-time.

Instructions of Bid / Offer Acceptances (BOAs) must have an end time and can only be made between real-time and the end of the Balancing Mechanism (BM) Window. However, some instructions such as Ancillary Service contracts require open ended instructions to be logged that can apply to times outside the BM window. For this reason there are two separate instruction types: BOAs and ASB instructions.

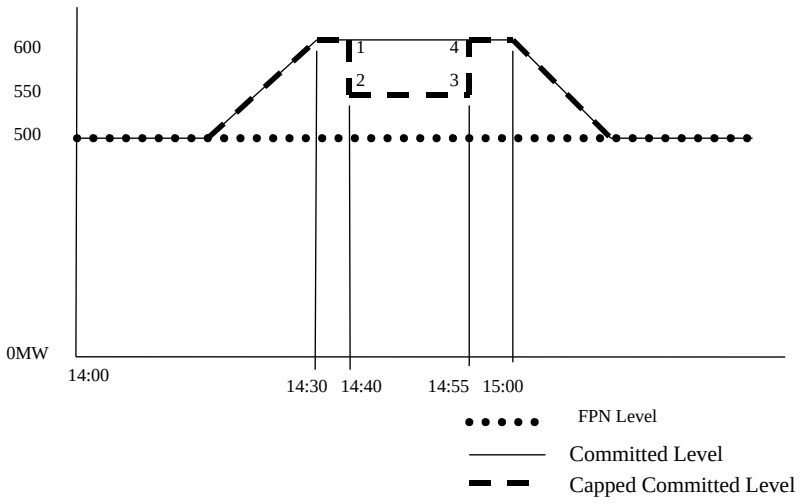
As Network Services Procurement (NSP) – formerly known as Pathfinders – contracts are delivered, some instructions to contracted units require open ended instructions to be logged that can apply to times outside the BM window. For this reason there are now instruction types for contracted static reactive power and Short Circuit Level (SCL) service providers.

GT instructions for both inside and outside of standing reserve windows shall be instructed as BOAs via the Electronic Instruction Logger.

2.2 Committed Level and Capped Committed Level

The Capped Committed Profile of a GBMU/DBMU is defined as the expected output of the unit that is determined by its Physical Notification and any Bid/Offer acceptances capped by MELs. The figure below illustrates the committed profile and the capped committed profile.

Committed and Capped Committed Profiles after a BOA followed by a redeclaration of MEL



The GBMU has submitted an FPN of 500MW. Subsequently an Offer has been issued up to 600MW with a target time of 14:30. After this the GBMU has redeclared its MEL to 550MW from 14:40 to 14:55.

2.3 From – To Time Formats and Despatch Advice

The BETTA agreement for Physical Notification submissions is to use a **From** and **To** time format This enables BMUs to submit ramping Physical Notifications and 'availability' (Maximum Export Limit) profiles. These changing profiles may, or may not be consistent with the submitted dynamic data of the BMU, however the instructed trajectory of the unit should always be with reference to the dynamic data. This will be consistent with the despatch algorithm. If a BMU has submitted an FPN that is ramping up (or down) at its declared RUR, then the despatch algorithm will not give advice to use Offers (or Bids) on the unit, as it will see that it is already ramping at its declared rate.

2.4 Allowable Instruction Envelopes

Gate Closure is a point one hour prior to the start of a Settlement Period.

In relation to a particular time, the Balancing Mechanism Window Period (BM Window) is the period from that time to the end of the Settlement Period for which Gate Closure has most recently occurred at that time. The Balancing Mechanism Window Period has a duration of between 1 and 1 ½ hours. The allowable instruction envelope of a BOA is defined by the BM Window, the dynamic parameters submitted by the BMU and the Bid/Offer pair information. Note under BETTA MEL, SEL etc. is included as dynamic data. If there is a conflict between parameters (e.g. MNZT) and a BOA then NGESO shall only adhere to dynamic parameters that lie wholly within the BM window.

2.4.1 BM Window

Bid Offer Acceptances can only be issued within the BM Window, the duration of which is set by the 1 hour Gate Closure Period. The maximum duration of any BOA is 90 minutes. For example a BOA issued with a log time of 14:00 must end at 15:30, i.e BM Window closure, therefore giving a duration of 90 minutes. If the BOA is made with a log time of 14:15 the instruction must still end at BM Window Closure 15:30, giving a duration of 75 minutes. The Electronic Instruction Logger will not allow BOA instructions to be sent that go beyond the end of the BM Window.

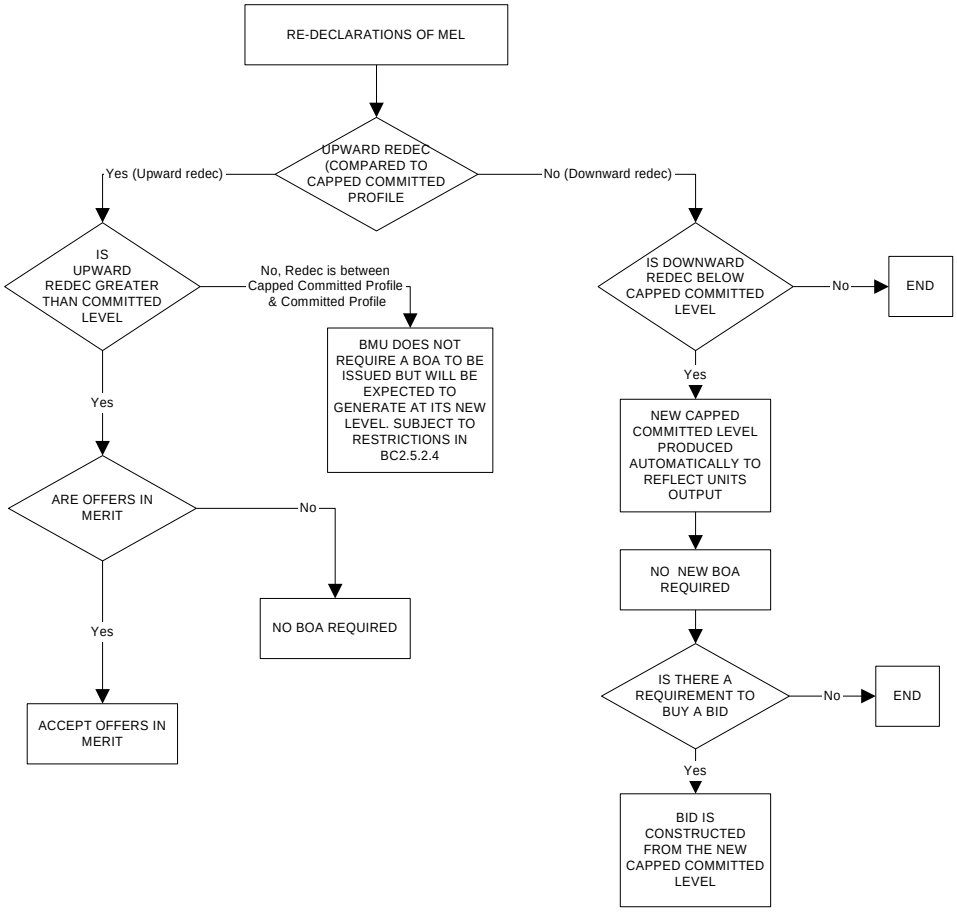
2.5 Re-declarations of Data

2.5.1 Data Flow

BMUs will be able to re-declare dynamic data within the BM Window by EDL. The capped committed level and availability envelope of a unit will be updated following a re-declaration of data. For more details see Data Validation, Consistency and Defaulting Rules (see 3, section 1.3).

The rules specify that a BM Unit cannot re-declare its PN within the BM window. If a GBMU cannot meet its FPN, it should re-declare its MEL level (Grid Code BC2.5.3.3). This value will then cap the unit's expected output. A new instruction will not be needed to capture the unit's revised expected output, as any previous instruction would have been closed and firm on the unit.

2.5.2 Re-declarations Flow Diagram



Redeclarations Flow Diagram

There are a few different cases where downward re-declarations could arise as illustrated in figure above.

2.5.3 Genset Failures

If a BM unit trips (other than intertrips) then it will not require a new instruction. However it would be expected to re-declare its MEL to zero. This will be reflected in the level of the zonal instructed output. The logging requirement for intertrips is detailed in section 3.5.

Summary – Downward redeclarations do not require new instructions to be sent to the BM Unit. They will cap a unit's future BOAs that are available to be instructed.

Summary – Upward redeclarations do not require new instructions to be sent to the BM Unit. If operating below the committed level a BMU may wish to ramp up to its committed level to avoid imbalance costs (an instruction is not required) but the ramp rate up is restricted as detailed in Grid Code ref. BC1.A.1.1.

3. Bid-Offer Acceptances

Instructions sent to Demand BMUs should follow the same format of instruction as for a Generation BMU. As DBMUs are generally not operationally metered the actual demand variation of the DBMU is unknown. Instructions to DBMUs shall be required to comply with the submitted dynamic data for the units including Maximum Delivery Period and Maximum Delivery Volume.

The specification for the Balancing Mechanism and Imbalance Settlement specifies that Bid-Offer Acceptance Data shall comprise of the following information.

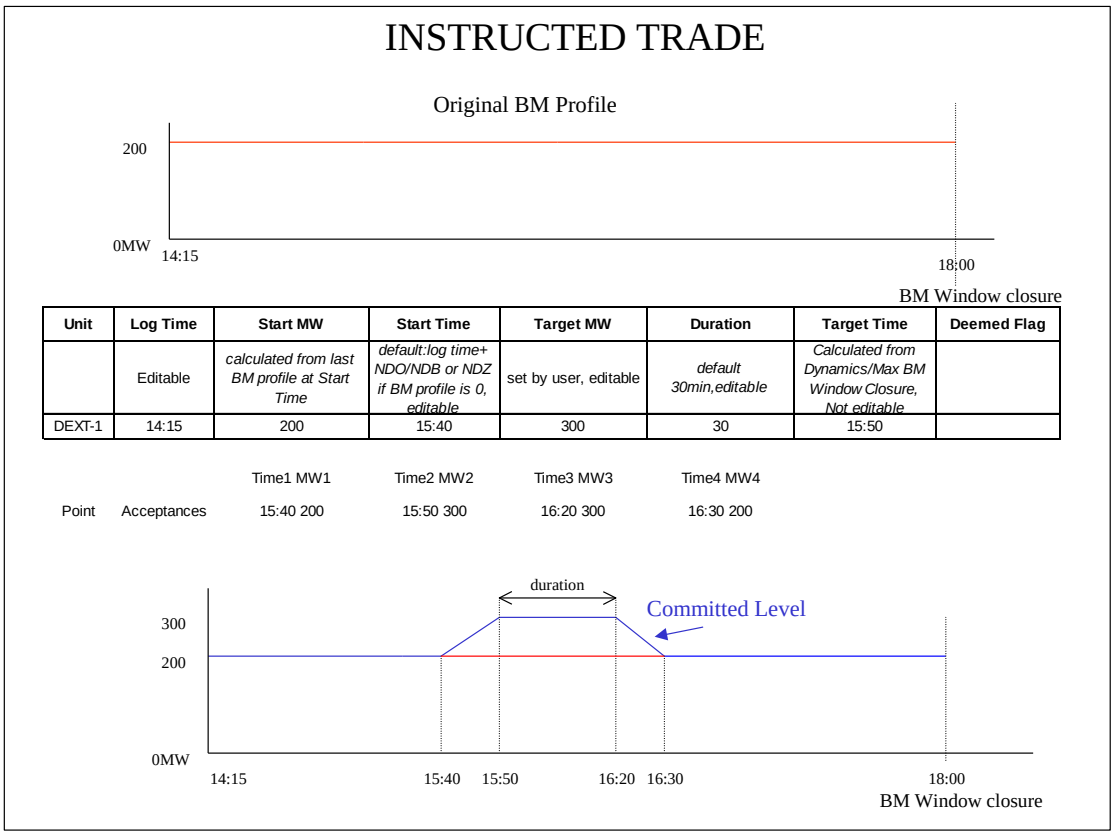
- Two or more Point Acceptance Volumes, expressed in MW for spot times, t (in a whole number of minutes), within the BM Window Period.
- The associated Bid-Offer Acceptance Number, k.
- The associated Bid-Offer Acceptance Time .
- A Deemed Bid-Offer Acceptance Flag, if the Bid or Offer being Accepted is a Deemed Bid or Deemed Offer.

The Electronic Instruction Logger provides a means of communicating the information specified above to the BM unit within the BM Window. The profile of a Bid-Offer acceptance issued must be physically deliverable based on the information available at the time. The number of point acceptances required to define a closed volume will vary (between 2 and 5) depending on the capped committed profile and the type of acceptance required.

When selecting the Bid-Offer Acceptances NGESO shall consider the future CGO targets the current total of BMUs for the zone (instructed output), the Bid and Offer prices of the unit and the duration of the instruction. The following examples define the principles for logging instructions.

3.1 Bid or Offer Acceptances on a Flat Profile

Consider the BMUnit DEXT-1 that has submitted a profile as shown below. DEXT-1 has submitted a flat PN of 200MW, which has rolled into the BM window to become the committed level. At 14:15 it is then instructed to 300MW starting at 15:40.



Instructed Trade

An example of this type of instruction is shown above. To define the closed volume, four point acceptances must be specified. This is achieved by the user setting up the instruction in the logger. The length of the instruction before the BMU returns to its last profile is set by the user in the **duration** field. In the example this is 30 minutes.

From the above example the data required by the BMRA is:

BM Unit Dext-1 Bid-Offer Acceptance k Bid-Offer Acceptance Time – 14:15 (Log Time)	
Point Acceptance Level MW	Associated Time
200	15:40
300	15:50
300	16:20
200	16:30

If a Bid acceptance is issued a similar format shall be used. This example illustrates the requirement for the closed part of the instruction to be automatically formatted to the BM profile. The response code is not relevant for this instruction and so is not sent with the instruction.

3.2 Bid Offer Acceptances on a Varying Profile

Bid Offer Acceptances issued on a varying profile shall be formatted in the same way as described in section 3.1. The Electronic Instruction Logger will automatically calculate the last point of the Bid Offer acceptance, which will be displayed as the last point acceptance after formatting the instruction.

3.3 Altering Synchronising and Desynchronising Times of a GBMU

The Grid Code (ref BC2.5.2) details the circumstances under which a BMU may synchronise or de-synchronise. It states that a BMU shall synchronise or de-synchronise within 5 minutes of its indicative synchronising/de-synchronising time as notified via the FPN.

NGESO may wish to alter the sync or desync of a GBMU that has submitted an FPN of 0MW. In order for the GBMU to synchronise to the system, an Offer from 0MW will need to be accepted. After acceptance of the offer the GBMU would be expected to synchronise within 5 minutes of the Offer acceptance start time.

If a GBMU with a positive FPN is required to be desynchronised a Bid will be required to be accepted. Again, the unit will be expected to desynchronise within 5 minutes of the 0MW-target time of the Bid. The format for logging the Offer or Bid will be similar to the general instruction as described in section 3.1.

3.4 Deemed Bids and Offers

The BMIS specifies the ability of the system operator to instruct units even if Bid-Offer data has not been submitted. This provision was to be through the use of Deemed Bids and Offers. However, the requirement to issue Deemed Bids and Offers has now been withdrawn. If a BMU has accepted a Bid or an Offer and it does not have a valid available Bid or Offer the point acceptances will still stand as they were issued.

3.5 Generators on Intertrip

Generation BMUs that have tripped due to the initiation of a prearranged intertrip shall be logged Bid Acceptances. If there is any doubt whether the GBMU has tripped correctly due to the operation of an intertrip then no BOA shall be issued.

3.5.1 Example Instruction for a GBMU BOA on Inter-trip

In the example below the generator tripped from 400MW to 0MW at 1034. The OFF instruction prompts the user to select the format for a generator intertrip. This will set the Target Time equal to the Start Time and the target MW to 0 as shown below.

	Unit	Log Time(day)	Start MW	Start Time	Target MW	Duration	Target Time	Deemed Flag
BOA	**DEXT-2**	**1034(30)**	**400**	**1034**	**0**	**Default end of window (editable)**	**1034**	**N/A**

The Bid-Offer Point Acceptances created from this are shown below. The Bid-Offer Acceptance to 0MW extends to the end of the BM window.

BM Unit Dext-2, Bid-Offer Acceptance k, Bid-Offer Acceptance Time – 10:34	
Point Acceptance Level MW	Associated Time
400	10:34
0	10:34
0	14.30

This type of instruction will always have to be logged retrospectively. The duration of the instruction will have to be considered, as it will depend on how long it is expected for the unit to be OFF. In any event the maximum Bid that can be logged will be from the time of the trip to the end of the BM window.

4. Ancilliary Service Instructions

4.1 Instruction of Frequency Response

A GBMU may require a frequency response instruction irrespective of whether it has been issued a BOA. Frequency Response instructions shall be issued following advice from the Frequency Response Despatch Facility. As instructions to GBMUs to provide frequency response are not a part of Bid/Offer acceptances they do not need to comply with the same rules i.e. the instructions are not closed and can span time periods outside of the BM window. Frequency response instructions **do not** require a target MW level. The following information is required for a frequency response instruction:

Log Time: Time of the Instruction

Start Time: User Editable, Default is Log Time + 2 minutes. It is assumed that the Target Time of the instruction is identical to the Start Time.

Reason Code: The Reason Code indicates the type of response that the unit is instructed to. Details of the reason codes can be found in the EDL Interface Specification (Appendix C).

As frequency response instructions are open-ended it is important that GBMUs that are expected to desynchronise are issued with a Limited Frequency Sensitive instruction before they desynchronise. This will avoid the potential for unsynchronised GBMUs having outstanding frequency response instructions.

Ancillary Service payments for frequency response will cease if a BMU's committed profile is detected to be below Stable Export Limit (SEL) or if MEL < SEL. This should be taken account of when issuing frequency response instructions especially in circumstances where a GBMU re-declares its MEL below SEL for short periods.

From September 2020, NGESO began a move to three new response products, Dynamic Containment (DC), Dynamic Moderation (DM) and Dynamic Regulation (DR). Initially these will be procured in a day ahead auction, and a new disarm reason code has been added to cease provision of these contracted services in real time. A new reason code has been added for each of these services to serve as a re-arm code to return to contracted provision, these codes can also be used if NGESO implements an optional market for any of these services.

A DNS reason code will be used to indicate that a provider should cease provision of contracted response services at the Start time. Note this does not remove the grid code obligation to provide Limited Frequency Sensitive Response.

A DC reason code will be used to indicate that contracted DC (Low and High) should resume at the Start time. If an optional market is introduced, then this code will be used to arm DC response. DCL, and DCH codes have also been added for the separate High and Low aspects of the service.

A DM reason code will be used to indicate that contracted DM (Low and High) should resume at the Start time. If an optional market is introduced, then this code will be used to arm DM response. DML, and DMH codes have also been added for the separate High and Low aspects of the service.

A DR reason code will be used to indicate that contracted DR (Low and High) should resume at the Start time. If an optional market is introduced, then this code will be used to arm DR response. DRL, and DRH codes have also been added for the separate High and Low aspects of the service.

4.2 Sync Comp Instructions (coded MNV)

When GBMUs are instructed to operate in the Sync Comp mode, then the instruction logged is based on whether the genset was initially synchronised or not.

If the GBMU is currently shutdown, then the START time is that calculated for a normal start (NDZ). The TARGET MW is entered as zero. The Reason code will be MNV.

For Stability Phase 1 Synchronous Compensator Contracts, the Response Time to synchronise a GMBU may not be equal to the NDZ, the GBMU Response Time is submitted by the provider. Where the GBMU Response Time does not equal the GBMU submitted NDZ parameter the START time must be calculated for a normal start (Response Time).

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-2	1215(29)	SYN	1220	0	0	MNV	1220

At the end of the requirement for sync comp the reason code shall be logged as MNS. The start time takes a two-minute station response time into account.

ASB	DEXT-2	1247(29)	0	1249	OFF	0	MNS	1249

If the GBMU is currently generating, then the instruction to Synch Comp should start at the end of the BOA. The example below indicates the previous BOA that has been given to DEXT-4. The start time of the ASB instruction will take into account a 2-minute station response time.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
BOA	DEXT-4	1509(30)	0	1511(30)	25	30	N/A	1514
Point Acceptances	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1511	0	1514	25	1544	25	1547	0

ASB	DEXT-4	1545	SYN	1547	0	0	MNV	1547

When a GBMU goes from Sync Comp mode to generate, then the logged entry will show the genset instructed with a BOA to its required output from zero. The start time of the BOA takes the NTO into account. A cancel Sync Comp instruction is implied by the issue of the BOA and shall be interpreted as such by the BMU.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-4	1645(30)	SYN	1647(30)	0	0	MNV	1647
BOA	DEXT-4	1710(30)	0	1712(30)	25	30	N/A	1715
Point Acceptances	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1712	0	1715	25	1745	25	1748	0

If a GMU fails to go into sync comp mode after an instruction, an ASB instruction shall be logged with a BNV code to reflect this.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-2	1215(29)	SYN	1220	0	0	MNV	1220
ASB	DEXT-2	1220(29)	0	1220	OFF	0	BNV	1220

If a GBMU trips whilst in sync comp mode, then an ASB instruction shall be logged to reflect the trip. In the example below the GBMU tripped at 13:05.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-2	1215(29)	SYN	1220	0	0	MNV	1220
ASB	DEXT-2	1305(29)	0	1305	OFF	0	BNV	1305

4.3 Warming Contracts

Warming Contracts will be used to guarantee that an identified GBMU will be available within certain time-scales. These are required because a GBMU may have submitted a NDZ greater than 89 minutes and BOAs cannot be issued for times greater than 89 minutes.

If the GBMU is required to generate following the warming contract it will be bought with an Offer Acceptance. Then, if it is no longer required, the warming contract will be cancelled. These instructions will recompense GBMUs where previously Cancelled Start Payments would have been made.

The new types of instructions for warming contracts are illustrated below and use the Hot Standby instruction codes (HTS, CHS).

4.3.1 Example Warming Contract Instruction

The following example illustrates the logging of an instruction to invoke a warming contract for DEXT-2.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Time to Synch	Reason Code	Target Time
ASB	DEXT-2	2000(29)	HTS	0700(30)	HTS	90	MN	0700(30)

This example invokes a warming contract that ensures DEXT-2 will be at 90 minutes' notice at 0700. DEXT-2 will declare as part of a later submission a Notice to Deviate from Zero of 90 minutes at 0700.

If this instruction is cancelled before 0700 then the following instruction can be issued and compensation payments can be paid to the generator for the cost incurred.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-2	0400(30)	HTS	0700(30)	CHS	0	MN	0700(30)

The cost incurred can be an agreed £/hr rate set out in an AS agreement. The reason code shall be used to indicate whether the CHS instruction was due to the BMU (BN) or NGESO (MN).

4.3.2 Unit is cancelled after start of warming period

The warming fee is paid until the time at which the unit is to be at the shorter notice to deviate from zero is reached. After this a Hot Standby £/hour fee is paid for remaining at this shorter notice.

In this example, if the BMU is held at the 90 minutes' notice after the end of the warming period and then cancelled the following instruction would be issued. The reason code shall be used to indicate whether the CHS instruction was due to the BMU (BN) or NGESO (MN).

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXT-2	1000(30)	HTS	1000(30)	CHS	0	MN	1000(30)

4.3.2 Unit is synchronised from Hot Standby

If after the warming period, the unit is required to synchronise by NGESO then a BOA shall be issued. This means that the instruction needs to be consistent with all other BOAs. The BOA will imply a CHS instruction and taken as such by the BMU. In the example shown below DEXT-2 is instructed at 0730 to synchronise from Hot Standby at 0900. In this the earliest time the BMU can synchronise will be taken from its NDZ which should have previously been set equal to the time to synchronise from Hot Standby by the BMU. In this case the BMU should redeclare it's NDZ to 90 minutes, which would give an earliest synch time of 0830, given that it will reach HTS at 0700.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
BOA	DEXT-2	0730(30)	0	0900(30)	400	30	N/A	1045

4.4 Instructions to Open Cycle Gas Turbines

Open Cycle Gas Turbines may be instructed with BOAs similar to other BMUs as described in section 3. A normal BOA for an OCGT will not require a special reason code to be logged separately, however Gas Turbines may also be instructed in special circumstances as detailed in this section. GTs instructed during Standing Reserve periods shall be instructed with BOAs according to their prices submitted through the normal Balancing Mechanism process.

4.4.1 Fast Start (Coded MNF)

If a GT is manually instructed to fast start, the instruction START time takes into account the NTO but not the NDZ time. The instruction will be sent as a BOA and a separate reason code shall be sent to indicate that a fast start is required. The instructions shall be logged with the same start times. The following example indicates the instructions for a manual fast start at 0945. The ASB instruction should be entered before the BOA

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time

ASB	DEXTGT-2	0945(30)	SYN	0948(30)	0	0	MNF	0948
BOA	DEXTGT-2	0945(30)	0	0948(30)	25	10	N/A	0950
Point Acceptance	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	0948	0	0950	25	1000	25	1003	0

4.4.2 Failure of GT Manual Fast Start

If a GT does not synchronise after a manual fast start, then the instruction shall be logged as follows:

ASB	DEXTGT-2	0945(30)	0	0945(30)	OFF	N/A	BNF	0948

The start time is either the time that the GT should have come on or the time that the GT tripped off without instruction. The target reason code is BNF.

If the GT trips after synchronising the start time shall be entered as the time the GT tripped.

4.4.3 LF Relay Start (Coded MNL)

If a GT start is initiated on LF relay operation the LF start is logged as an ASB instruction with an MNL code. When a GT starts on LF relay operation, the instruction LOG and START times should be set to the LF relay trip time. The third character of the reason code is set to L. The Start MW is set to SYN, Target MW and Duration are left as 0 as they are not included in the ASB instruction.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	0945(30)	SYN	0945(30)	0	0	MNL	0945(30)

If a GT is started automatically following a valid LF relay operation, then it is contracted to run for 15 minutes after reaching full load as an Ancillary Service. Following the 15 minutes the GT will continue to generate until it receives either a BOA or an AS OFF instruction from NGESO.

If the GT is required to be kept on for longer than 15 minutes after the GT has reached full load from the LF relay initiation, then a BOA is required to be sent. The duration of the BOA can be edited as required. In the example below it is left at the 30-minute default and the GT takes 3 minutes to reach full load. The sequence of instructions is logged as follows:

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	0945(30)	SYN	0945(30)	0	0	MNL	0945
BOA	DEXTGT-2	0953(30)	0	1003(30)	25	30	N/A	1006
Point Acceptance	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1003	0	1006	25	1036	25	1003	0

The GT is expected to follow the BOA and shut down at 10:39.

If the GT is required to shut down during or following the contracted 15 minutes, then an AS instruction is required to instruct the GT to 0FF giving the sequence of instructions as follows:

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	0945(30)	SYN	0945(30)	0	0	MNL	0945
ASB	DEXTGT-2	0955(30)		1003(30)	OFF	N/A	MNS	1003

If a BOA is not issued following the contracted 15 minutes after the LF start the GT will be expected to continue generating. A retrospective BOA should not be issued from the end of the 15 minutes but should be issued from current time if the GT is required to continue running.

4.4.4 Failure of LF start

When GT starts are (or should be) initiated by the operation of low frequency relays, then AS entries are to be made in the logger for all the appropriate GTs. The entry will be of the form shown in 4.3.3.

Should a GT fail to synchronise or initiate a LF start for a sufficiently low frequency then its failure should be recorded as a ASB instruction with a BNL reason code.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	0945(29)	SYN	0945(30)	0	0	MNL	0945
ASB	DEXTGT-2	0945(30)	0	0945(30)	OFF	0	BNL	0945

4.4.5 Failure of GT Manual Normal/Slow Start

If a GT does not synchronise after a manual normal/slow start instruction to generate has been given via a BOA then the instruction is still valid and no further instructions are required to be logged.

4.4.6 Sync Comp Instructions (coded MNV)

When GTs are instructed to operate in the Sync Comp mode, then the instruction logged is based on whether the genset was initially synchronised or not.

If the GT is currently shutdown, then the START time is that calculated for a normal start (NDZ). The TARGET MW is entered as zero. The Reason code will be MNV.

For Stability Pathfinder (Phase 1) Synchronous Compensator Contracts the time to synchronise a GMBU may not be equal to the NDZ, the GBMU time to synchronise is submitted by the provider and recorded. Where the GBMU time to synchronise does not equal the GBMU submitted NDZ parameter the START time must be calculated for a normal start.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	1215(29)	SYN	1220	0	0	MNV	1220

At the end of the requirement for sync comp the reason code shall be logged as MNS. The start time takes a two-minute station response time into account.

ASB	DEXTGT-2	1247(29)	0	1249	OFF	0	MNS	1249

If the GT is currently generating, then the instruction to Synch Comp should start at the end of the BOA. The example below indicates the previous BOA that has been given to DEXTGT-4. The start time of the ASB instruction will take into account a 2-minute station response time.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
BOA	DEXTGT-4	1509(30)	0	1511(30)	25	30	N/A	1514
Point Acceptances	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1511	0	1514	25	1544	25	1547	0

ASB	DEXTGT-4	1545	SYN	1547	0	0	MNV	1547

When a GT goes from Sync Comp mode to generate, then the logged entry will show the genset instructed with a BOA to its required output from zero. The start time of the BOA takes the NTO into account. A cancel Sync Comp instruction is implied by the issue of the BOA and shall be interpreted as such by the BMU.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-4	1645(30)	SYN	1647(30)	0	0	MNV	1647
BOA	DEXTGT-4	1710(30)	0	1712(30)	25	30	N/A	1715
Point Acceptances	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1712	0	1715	25	1745	25	1748	0

If a GT fails to go into sync comp mode after an instruction, an ASB instruction shall be logged with a BNV code to reflect this.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	1215(29)	SYN	1220	0	0	MNV	1220
ASB	DEXTGT-2	1220(29)	0	1220	OFF	0	BNV	1220

If a GT trips whilst in sync comp mode, then an ASB instruction shall be logged to reflect the trip. In the example below the GT tripped at 13:05.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
ASB	DEXTGT-2	1215(29)	SYN	1220	0	0	MNV	1220
ASB	DEXTGT-2	1305(29)	0	1305	OFF	0	BNV	1305

4.5 Network Services Procurement Instructions and Notifications

4.5.1 For units able to deliver Static and Dynamic Reactive Power Services

Where a unit is able to operate in both static (constant MVAr) and dynamic (constant voltage) reactive power modes under a Network Services Procurement contract, ESO shall use the VQV and VQO reason codes to instruct the unit to switch between modes.

To instruct a unit to operate in static mode, ESO shall issue the VQV reason code The START time is that calculated for a normal start to honour the submitted time to start for the static reactive power service. The TARGET MW is entered as zero.

For the static reactive power service contracts, the time to start a static reactive power service may not be equal to the NDZ, the time to start value is submitted by the provider. Where the GBMU static reactive power service time to start does not equal the GBMU submitted NDZ parameter the START time must be calculated for a normal static reactive power service start. The START time takes a two-minute station response time into account.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
	DEXT-2	1215(29)	SYN	1220	0	0	VQV	1220

Where the ESO subsequently requires the unit to operate in dynamic reactive power mode, it shall issue the VQO reason code. The START time is that calculated for a normal start to honour the submitted time to start for the dynamic reactive power service. The TARGET MW is entered as zero

	DEXT-2	1247(29)	0	1249	0	0	VQO	1249

Where a unit is only able to operate in a single mode, then the code VQV shall be used to instruct the start of the service.

At the end of the requirement for reactive power services the reason code shall be logged as VQO.

	DEXT-2	1247(29)	0	1249	OFF	0	VQO	1249

4.5.2 Constraint Management Intertrip Service Arm / Disarm EDL Notification

Under the Constraint Management Intertrip Service (CMIS), a GBMU may have an agreement to provide generator intertrip services, however the GBMU does not arm or disarm the intertrip itself. Therefore, EDL reason codes shall be issued by the ESO according to system operational need to inform the GBMU of the intertrip status. As notifications to GBMUs to provide agreed intertrip services are not a part of Bid/Offer acceptances they do not need to comply with the same rules i.e. the instructions are not closed and can span time periods outside of the BM window. Intertrip arm or disarm EDL reason code notifications **do not** require a target MW level. The following information is required for arm or disarm EDL reason code notifications:

- Log Time: Time of the notification
- Start Time: User Editable, Default is Log Time + 2 minutes. It is assumed that the Target Time of the notification is identical to the Start Time.
- Reason Code: The Reason Code shall be: ITA for Intertrip Armed and ITD for Intertrip Disarmed to indicate the type of intertrip service that the unit is instructed to. Details of the reason codes can be found in the EDL Instruction Interface - Valid Reason Codes Specification.

As intertrip arm or disarm EDL reason code notifications are open-ended it is important that GBMUs that are expected to desynchronise have the intertrip disarmed and are notified of the disarming by being issued with an intertrip disarm EDL reason code notification before they desynchronise. This will avoid the potential for unsynchronised or GBMUs remaining armed to provide intertrip services.

4.5.3 Provision of Short Circuit Level

Under Stability contracts, units may be required to deliver Short Circuit Level as well as other capability such as inertia. For certain forms of technology, it may be able to separate the provision of SCL and inertia and therefore a new set of reason codes have been created to specifically instruct the start and cease of SCL service. The Reason Codes shall be: SCL for start instruction of SCL service and SCO for cease instruction of SCL service. Details of the reason codes can be found in the EDL Instruction Interface - Valid Reason Codes Specification.

For units that cannot separate the delivery of SCL and inertia, the codes MNV and MNS shall be used for start and cease instructions respectively.

The START time is that calculated for a normal start to honour the submitted time to start the SCL service. The TARGET MW is entered as zero.

For stability contracts, the time to start the SCL service may not be equal to the NDZ, the time to start value is submitted by the provider. Where the units service time to start does not equal the GBMU submitted NDZ parameter the START time must be calculated for a normal static reactive power service start. The START time takes a two-minute station response time into account.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
	DEXT-2	1215(29)	SYN	1220	0	0	SCL	1220

Where the ESO subsequently requires the unit to cease SCL delivery, it shall issue the SCO reason code.

	DEXT-2	1247(29)	0	1249	OFF	0	VQO	1249

4.6 Valid Reason Codes

Reason Codes are logged with all AS instructions. The valid reason code combinations are defined in the EDL Instruction Interface - valid Reason Codes document.

5. Emergency Instructions

Where system conditions are such that a BMU is involved in a period of abnormal or emergency operation, e.g. supporting local demand in a post fault islanded group, or has been instructed outside of the available bids for high frequency control, then an AS instruction shall be logged with an E as the first character of the Reason Code. The period of abnormal operation will be considered as continuing until a non-emergency coded instruction is issued.

The log for an emergency instruction should be completed as follows:

1. The instruction START TIME will record the time when the emergency period of operation commenced. This may be entered retrospectively.
2. The TARGET TIME will be set to the START TIME.

	Unit	Log Time (day)	Start MW	Start Time	Target MW	Duration	Reason Code	Target Time
BOA	DEXT-1	1732	350	1734	200	30	N/A	1749
ASB	DEXT-1	1732	0	1734	0	0	EN	1734

Point Acceptances	Time1	MW1	Time2	MW2	Time3	MW3	Time4	MW4
	1734	350	1749	200	1819	200	1834	350

The Dexter BMU has a capped committed profile of 350MW but due to a system fault the output is instructed to below its SEL. An ASB instruction is also logged at this time with an emergency code to highlight that an emergency instruction has been issued. It is expected that these instructions will be entered retrospectively following discussions with the station. Note that at the end of the BOA the BMU would be expected to follow its capped committed profile, which is to pick back up to 350MW.

ASB	DEXT-1	1825	0	1827	0	0	MN	1827

If this is not required, then a further instruction shall be logged. In the example above the emergency conditions are no longer required at 1827 and a reason code of MN is sent to reflect this.

Appendices

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Appendix A – Document Information

Document Author

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Document Amendment History:

Version	Date	Amended By	Remarks
2.0	12 Dec 2000	Paul Robinson	Issued for NETA go-live
2.0	7 Feb 2000	Paul Robinson	Modified following re-issue of OS210
2.0	3 Apr 2003	Paul Robinson	Modified following re-issue of OS210 for One Hour Gate
4.0	1 Jan 2021	John Walsh	Updated to reflect EDL instructions for Stability Pathfinder services
5.0	22 Oct 2021	Angela Wilks	References to NETA replaced by BETTA, reference to QPN removed following Code Change GC0135 and updated to add new reason codes VQV / VQO to start / stop a static reactive power service
6.0	20 Jan 2022	Stuart Brace	Updated to add EDL disarming/re-arming instructions for Dynamic Moderation, Dynamic Regulation and Dynamic Containment
7.0	01 Feb 2023	Haarith Dhorat	Add new 4.5.2 for new reason codes ITA and ITD for intertrip service
8.0	24 January 2024	Haarith Dhorat	Rename of Pathfinders to Network Services Procurement. Update to 4.5.1 to allow VQV / VQO codes to switch between static and dynamic modes. Add new 4.5.3 for new reason codes to instruct start / cease delivery of SCL, separate to inertia.

Appendix B – Definitions

Term	Definition
ASB	Ancillary Service and Balancing
BMIS	Balancing Mechanism and Imbalance Settlement
DBMU	Balancing Mechanism Reporting Agent
BOA	Bid Offer Acceptance
DBMU	Demand Balancing Mechanism Unit
FPN	Final Physical Notification
GBMU	Generation Balancing Mechanism Unit
IPN	Initial Physical Notification
MEL	Maximum Export Limit
NTB	Notice to Deliver Bids
NTO	Notice to Deliver Offers
NDZ	Notice to Deviate from Zero
PN	Physical Notification
QPN	Quiescent Physical Notification
RUR	Run Up Rate
SEL	Stable Export Level
CL	Committed Level – This is the commercially contracted output of a Balancing Mechanism unit. It is the Physical Notification modified by Bid/Offer Acceptances. Where no Bid Offer Acceptances have been made, this is the Physical Notification of the unit.
CCL	Capped Committed Level - This is the expected output of a Balancing Mechanism unit. It is the Physical Notification modified by Bid/Offer Acceptances and capped by the MEL, if applicable. Where no Bid Offer Acceptances have been made, this is the Physical Notification of the unit capped by MEL.
DC	Dynamic Containment
DM	Dynamic Moderation
DR	Dynamic Regulation

Appendix C – Related Documents

1. RETA Glossary of Terms and Definitions
2. NETA Timing Conventions – 25th May 2001 – Chris Sturgeon
3. NETA Data Validation Consistency and Default Rules IS-SO/24.12.0003 Current Issue
4. EDL Instruction Interface Specification – Valid Reason Codes
   https://www.nationalgrideso.com/document/33351/download

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