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Dialogue Code for expressing site balancing orders to generation sites V4.0

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CONTENTS

Table of Contents

1 Background and purpose of the document

1.1 Why a dialogue code?

During the balancing workflow, RTE and Balancing Service Providers are required to send orders to generation units describing their expected operation, in terms of:

- Active power delivered over the network,
- Frequency containment reserve (FCR) made available to the system (if the group participates in the primary frequency setting),
- Automatic frequency restoration reserve (aFRR) made available to the system (if the generation unit participates in the automatic frequency restoration frequency setting).

This document deals with the definition and expression of orders defining this information, as part of the Balancing Mechanism: implicitly, when it comes to orders sent to power plants, these three types of setpoints will be involved — knowing that, moreover, many other types of orders can be sent to power plants (voltage management, operating manoeuvres, etc.).

Compliance of the EDAs' behaviour with the balancing orders that are sent to Order Recipients (ROs) is essential for system management and reliability. To ensure compliance with balancing orders, each order must be clear and unambiguous, and must be executed in a timely manner in a real-time operating environment, including in tense incident situations: it must therefore have been defined in advance in its form and in its translation into a gesture of operation.

This document is limited to orders sent to EDAs constituted by generation units, to extraction facilities comprising an EDA or to EDAs at the point of exchange under the balancing mechanism. It does not address how to send redeclarations to infra-day gate closures. The vocabulary is consistent with that used in the BRE/Balance Mechanism rules [1]. The most frequently used acronyms are specified in the glossary at the end of the document.

1.2 Purpose of the document

This document is placed in an operating situation such that the responsibilities of RTE and generators are those defined in the RE/Balance Mechanism rules.

The main principles of this division of responsibility are as follows:

- The Final Dispatch Schedule to be followed by an EDP results from the Forecast Dispatch Schedule transmitted to it by its Scheduling Agent, any re-declarations, technical constraints, and Orders of Balancing.
    - In a normal power system control situation, balancing orders are transmitted via the TAO device. Details of the use of this tool are provided in [2]. (see Chapter 7)
    - In the event of an outage of TAO, specific balancing RTE orders shall be made by telephone through the Balancing Service Providers.
- The Balancing Service Provider is obliged to implement the Balancing Orders sent to him by RTE, from the moment it is accepted. Any Balancing Order accepted by the Order Recipient shall be deemed to be executed by RTE. If it is totally or partially impossible to execute a

Balancing Order, the Balancing Service Provider informs RTE as soon as possible by telephone or by sending an email in the RTE-CNES-FAXEOD balance for a volume of less than 25 MW.

The rest of the document is devoted to the manner in which balancing orders are expressed in this context with:

- The description of the EDA operating points and the associated implicit code in triplet and quintuplet (Chapter 3 and 4),
- The description of balancing orders (Chapter 6).

Version 4.0 of this document introduces the description of orders with an asymmetric frequency containment and automatic frequency restoration reserve. The use of operating points and symmetric implicit code will be phased out. The two codes may coexist over a transitional period, until asymmetric balancing orders are generalized.

2 Designation of EDAs

As a general rule, when the balancing orders are transmitted, the EDAs are designated by the name of the EDA mentioned in the Balancing Service Provider's balancing perimeter. Special cases are mentioned in technical conventions.

In so-called "dual-fuel" generation units, the fuel type will be associated with the EDA name, if necessary.

3 Operating points for thermal generation units

The purpose of this chapter is to define symmetrical and asymmetrical operating points used for conventional or nuclear thermal generation units.

3.1 Specifying operating points with symmetric reserve

3.1.1 Concept of triplets

In order to be able to manage variations in maximum and minimum powers of conventional thermal generation units and nuclear generation units, balancing orders are transmitted as a triplet with an implicit code:

< **implicit code, x,y,z** >

- The implicit code is a predefined code that describes the desired operating point of the balancing (see list in 3.1.2.)
- **x** is the setpoint power, i.e. the active power to be delivered on the network, expressed in MW;
- **y** gives in MW the frequency containment reserve to be made available to the system upward and downward;
- **z** is the expression in MW of the half-band of remote control to be made available to the system upward and downward.

The Frequency Containment Reserve (automatic frequency restoration, respectively) is specified as zero if the group does not participate in the frequency containment (automatic frequency restoration, respectively) setting.

3.1.2 Implicit codes that can be used with a symmetric reserve

To list and define the implicit codes that can be used for conventional or nuclear thermal generation units, the following concepts are used:

- **Frequency Containment Reserve or FCR**: defined as the active power reserve available for the Frequency containment Frequency/Power Setting;
- **Automatic Frequency Restoration Reserve or aFRR** (abbreviated as Rs): otherwise known as the remotely set half-band, it is the power available for the automatic frequency restoration power frequency setting (RSFP), which can be released when the level increases from 0 to +1;
- **RpMax** is the sum of FCR and Rs: in other words, the power unit setting capabilities are all assigned to the frequency containment setting.

These frequency containment and automatic frequency restoration reserve contribution values are defined in the Technical Constraints Document and the Offer Terms of Use.

- A PCmax, PCRPmax, PC0max and P0max: the frequency containment and automatic frequency restoration reserves take the values of 'PRIM to PMax' and 'SEC to PMax' respectively
- A Pcinter and Pc0inter: the frequency containment and automatic frequency restoration reserves take the values of "PRIM to PInter" and "SEC to PInter" respectively
- At MT, PC0min and PCmin: the frequency containment and automatic frequency restoration reserves take the values 'PRIM to PMin' and 'SEC to PMin' respectively

The list of symmetric implicit codes that can be used for thermal generation is as follows:

Implicit Code	Description
PMD	The power unit produces the Maximum Available Power (PMD), outside of frequency containment setting and remote setting. PMD is the maximum net electrical active power that the power unit can produce; its value depends on the conditions of the moment: weather, environment, power unit state. It may, where appropriate, be higher or lower than the nominal power of the generation unit.
PCmax	The power unit is in frequency containment setting, not under automatic frequency restoration setting; it provides the highest possible net electrical power, while ensuring that the FCR is available in case of frequency deviation.
PC0max	The power unit is in frequency containment setting and participates in automatic frequency restoration setting; it provides the highest possible net power, while ensuring that FCR + Rs can be released during normal operation (without limiter).

Implicit Code	Description
P0max	Only for conventional thermal. The power unit is in automatic frequency restoration setting and out of frequency containment setting; it provides the highest possible net power while ensuring that RpMax can be released
PcRpmax	The power unit is in frequency containment setting and out of automatic frequency restoration setting; it provides the highest possible net power while ensuring that RpMax can be released in case of frequency deviation.
MT	The power unit is out of frequency containment and automatic frequency restoration setting; it is at least technical.
PCmin	For conventional thermal, the power unit is in frequency containment setting and out of automatic frequency restoration setting; it provides the lowest possible net electrical power, while ensuring that the FCR can be released. For nuclear, the power unit is in frequency containment setting and out of automatic frequency restoration setting; it provides the lowest net power possible, while ensuring that RpMax can be released in case of frequency deviation.
PC0min	The power unit participates in the frequency containment and automatic frequency restoration setting; it provides the lowest net power possible, while ensuring that Rp+Rs can be released during normal operation (without limiter).
Pl x	The power unit is out of frequency containment and automatic frequency restoration setting; it provides a net power of x MW. We talk about power to the limiter.
PCinter x	The power unit is in frequency containment setting and out of automatic frequency restoration setting; it is controlled to produce a net power of x MW when the frequency is 50 Hz. It participates in the frequency containment setting up to the FCR.
PC0inter x	The power unit participates in the frequency containment and automatic frequency restoration setting; it is controlled to produce a net electrical power of x MW when the frequency is 50 Hz and the automatic frequency restoration setting level which it receives at 0; in case of a frequency deviation, it ensures that FCR + Rs can be released
Low Load	The power unit is out of frequency containment and automatic frequency restoration setting; it is below the minimum technical power. This point corresponds to low load operation and only applies to certain thermal generation units.

Note: all of these orders use declarative setting (or remote setting) band values transmitted by the Producer.

There is no implicit order that may require, for example, to go to maximum power while retaining an earlier FCR value that is less than the declared value. To achieve this, it is necessary to pass an explicit order specifying the values of the quintuplet (resp. triplet) indicated by the stakeholder.

Example of symmetrical operating points:

The EDA ZZ0 shall produce 430 MW without participation in either frequency containment or automatic frequency restoration setting:

<PMD,430,0,0> on ZZ0

The EDA ZZ1 must produce 424 MW with a setting contribution of 6 MW in frequency containment:

<PCmax,424,6,0> on ZZ1

The EDA ZZ2 must produce 416 MW with a participation in the setting of 6 MW in frequency containment and 8 MW in automatic frequency restoration:

<PC0max,416,6,8> on ZZ2

3.2 Specification of operating points with asymmetric reserve

3.2.1 Concept of quintuplet

With the possibility of scheduling and balancing with non-symmetrical frequency containment and automatic frequency restoration reserves, the operating point evolves and is expressed using a quintuplet, associated with its implicit code.

< implicit code, x, y, y', z, z' >

- The implicit code is a predefined code that describes the desired operating point of the balancing. (See paragraph 3.2.2.)
- **x** is the setpoint power, i.e. the active power to be delivered on the network, expressed in MW.
- **y** gives the Frequency Containment Reserve in MW to be made available to the system upward;
- **y'** gives the Frequency Containment Reserve in MW to be made available to the system downward;
- **z** is the expression in MW of the remotely adjusted half-band to be made available to the system upward.
- **z'** is the expression in MW of the remotely adjusted half-band to be made available to the system upward.

3.2.2 Implied codes with asymmetric reserve

With the introduction of asymmetrical systems services orders, the number of possible quintuplet combinations has been increased. The code presented below has been developed on a logic allowing all situations to be covered. It will replace the code for symmetric orders as soon as the asymmetric orders can be sent.

The code has three variables separated by ".":

- Power level:
    - MAX to indicate "Maximum Power"
    - INTER to indicate intermediate power
    - MIN to indicate "Minimum Power"
- The frequency containment reserve value
    - 0: no frequency containment power delivered
    - 1: Frequency containment power downward only
    - 2: balanced frequency containment power
    - 3: Frequency containment power upward only
    - X: undefined (special case)
    - With a "+" suffix to indicate operation with a maximum value (RP+ = RP + RS)
- The automatic frequency restoration reserve value: same fields as the frequency containment reserve.

The frequency containment and automatic frequency restoration reserve values are preceded by the letters "P" and "S", respectively, to fluidize the communication.

These contribution values to the frequency containment and automatic frequency restoration reserves are defined in the Technical Constraints Document and in the Bid Terms of Use, and are based on setpoint power:

- At Pmax: the frequency containment and automatic frequency restoration reserves take the values of 'PRIM to PMax' and 'SEC to PMax' respectively
- In Pinter: the frequency containment and automatic frequency restoration reserves take the values of "PRIM to PInter" and "SEC to PInter" respectively
- At Pmin: the frequency containment and automatic frequency restoration reserves take the values 'PRIM to PMin' and 'SEC to PMin' respectively

A complete list of the operating points and their correspondence with the former implicit code is provided in the appendix of this document (Chapter 9).

Example of using quintuplet operating points:

The EDA ZZ0 shall produce 430 MW without participation in either frequency containment or automatic frequency restoration setting:

< MAX.P0.S0, 430,0,0,0,0 > on ZZ0

The EDA ZZ1 is expected to produce 424 MW with a 6 MW tuning share in frequency containment upward and downward:

< MAX.P2.P0, 424,6,6,0,0 > on ZZ1

The EDA ZZ2 is to produce 416 MW with a 6 MW tuning share in frequency containment and 8 MW tuning share in automatic frequency restoration:

< MAX.P2.S2, 416,6,6,8,8 > on ZZ2

The EDA ZZ3 is to produce 430 MW with a 6 MW tuning share in frequency containment downward:

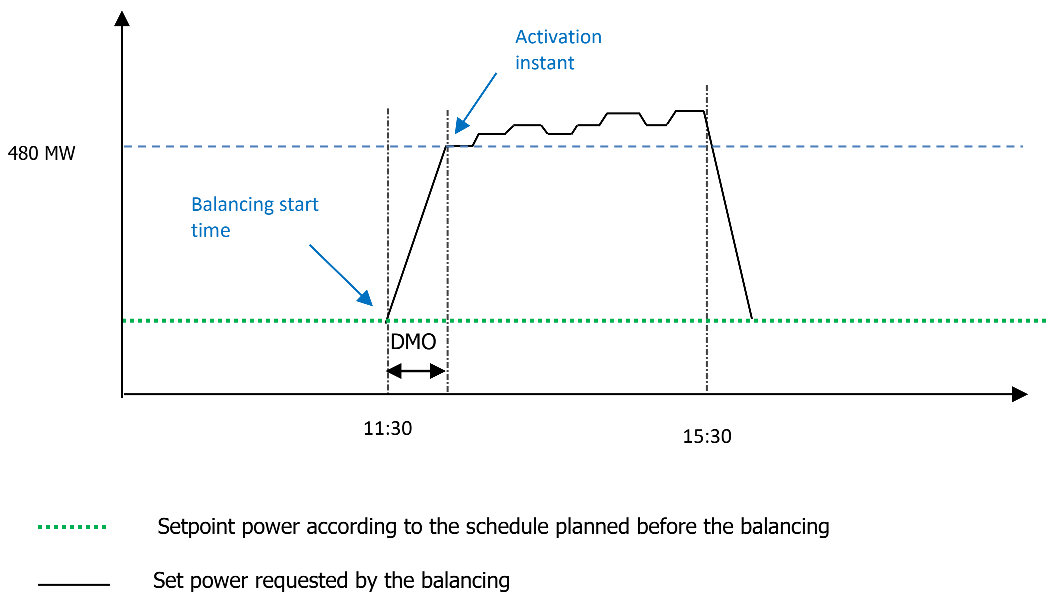
< MAX.P1.S0,430,0,6,0,0 > on ZZ3

3.3 Activation rule at the acceptance of an order

For thermal generation, an order consists of an implicit code and a quintuplet (or triplet).

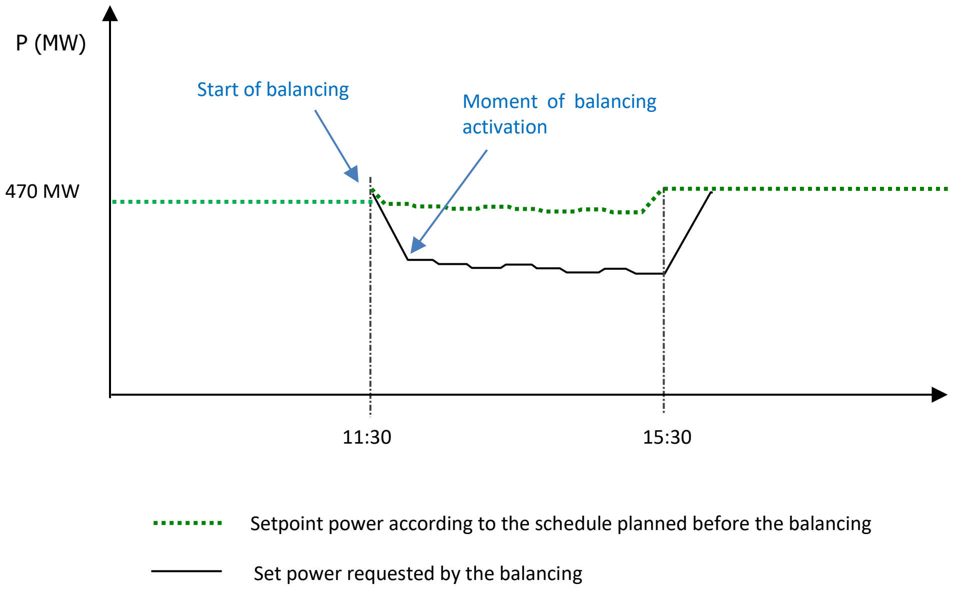
The setpoint power specified in the order corresponds to the active power at the valid operating point at the time of activation (i.e. at the time when the setpoint power is reached). It allows operators to verify the desired implicit code, knowing that the setpoint power can then evolve according to the powers declared in the Terms of Use of Offers, while the Frequency Containment Reserve and the automatic frequency restoration reserve are fixed over the entire duration of the balancing. The balancing service provider is then responsible for calculating the value of the setpoint to be reached for the implicit code transmitted at the end of the load change.

Example 1: order to climb to < MAX.P0.S0, 480, 0, 0, 0, 0 > (or <PMD, 480, 0, 0>) from 11:30 until 15:30.



The setpoint power of 480MW corresponds to the value of the active power of the requested operating point on the half-hourly step after the Full Activation Time, i.e. step]11.30, 12.00]. Then the generation group's setpoint power varies depending on the time series of the LDCs reported in the Terms of Use of Offers.

Example 2: From 11:30 to 15:30, go down to < MAX.P2.S0, 470,10,10,0,0 > (or <PCmax, 470, 10, 0 >)



The 470 MW setpoint power is calculated from the value of PMD on the half-hour interval at the beginning of the balancing, i.e. the interval]11:30, 12:00]. Since these are small changes in load, this setpoint power value also corresponds to the setpoint power value at the time the balancing is activated. Then the generation group's setpoint power varies depending on the time series of the LDCs reported in the Terms of Use of Offers.

For reasons of simplicity, in the remainder of the document, the maximum and minimum power values from which the setpoint power values are derived are considered to be fixed during the balancing period.

3.4 Special case of orders on EDAs subject to derating:

When the EDA is subject to derating (see Glossary in chapter 8), the FCR value accompanying the implicit code corresponds to the FCR expected by RTE within the time required by the reliability requirements of the Technical Reference Documentation.

Example:

Either a generation unit with a MAX.P0.S0 (or PMD) of 400 MW, a derating coefficient of 1.5, reporting values of Rp = 6 MW and Rs = 20 MW. The value of MAX.P2.S0 is equal to "MAX.P0.S0-1,5*Rp", i.e. the following operating points:

- The quintuplet accompanying an operating point at MAX.P2.S0 is (391,6,6,0,0)
- The quintuplet accompanying an operating point at MAX.P2.S2 is (371,6,6,20,20)

3.5 Priority rules

RTE calculates operating points based on information provided in the Offer Terms of Use (CT/CUO). Unless there is an error in the data used, the operating points transmitted are achievable by the power units making up the EDA.

In principle, if Balancing Service Providers provide up-to-date information to RTE on the technical constraints of EDAs through the Terms of Use of Offers, and if RTE complies with these technical constraints, the operating points will be achievable by the power units that make up the EDA.

However, in the event that an inconsistency between the triplet and the implicit code is detected or where the point of operation is not feasible by the generation unit in view of its characteristics and constraints at the time, the Balancing Service Provider shall seek a close point of operation by seeking in priority order:

- First to respect the participation in the frequency containment setting indicated by the implicit code;
- Then respect the participation in the automatic frequency restoration setting indicated by the implicit code;
- Then, finally, to set an active power value that adjusts to meet the two preceding terms.

The Balancing Service Provider shall indicate to RTE the correct implicit triplet-code correspondence as soon as possible. RTE confirms the balancing order with the quadruplet indicated by the Balancing Service Provider.

4 Operating points for hydraulic groups

Balancing orders for hydraulic generator sets are expressed via TAO or telephone, using a triplet (symmetrical order) or quintuplet (asymmetrical order) without specifying an implicit code. The triplet and quintuplet have the same definition as for thermal generation units.

For telephone orders, there are two options for specifying an operating point for a hydraulic EDA:

- Explicit power, with participation (or not) in remote setting,
- Explicit power, with no precision of participation (or not) in remote setting.

The first form is to be used as systematically as possible (§ 4.1). The second form is described where an order that does not decide on whether to participate in the remote setting has still been passed[1] (§ 4.2).

An exceptional form, known as "power in delta", is reserved for certain specific EDAs (§ 4.3). Its use must be the subject of a prior agreement between RTE and the balancing service provider.

[1] In particular, when the network is no longer in the situation of normal operation and speed of action is a priority.

4.1 Explicit power with or without remote setting

In this type of operating point pass, only the desired value for the setpoint value to be produced by the EDA is indicated and whether the EDA should (or should not) participate in the automatic frequency restoration setting.

When RTE specifies in its order whether or not remote control is involved, the message takes the following form:

Case 1:

```
100 MW on EDA1 without remote control
```

The producer’s expected interpretation is as follows:

- the operating points of the units are modified so that the overall power output of the EDA1 increases to 100 MW;
- if the EDA1 generation units are in a automatic frequency restoration setting, they leave — if they are not there, they do not return;
- if the generation units are suitable for frequency containment setting, they must participate.

Case 2:

```
100 MW on EDA2 with remote control
```

This case is identical to the previous one, except that it is specified that the EDA must participate in the automatic frequency restoration setting:

- if the EDA groups are in automatic frequency restoration setting, they stay there — if they are not there, they go back.

It is the producer who determines the number of groups that need to be in operation to achieve this setpoint, optimising the overall performance of the facility. Participation in the frequency containment setting can be inferred[2] from the power produced by each generation unit[3], it is therefore unequivocally determined once the number of generation units in operation and the power assigned to each generation unit are known. Participation in the automatic frequency restoration setting depends on the point of operation, it is provided in the DCT through the description of that point of operation.

The setpoint value may be accessible by different group start-up configurations, depending on whether the EDA is in automatic frequency restoration setting or not. However, there is no ambiguity since the participation (or non-participation) in the remote adjustment is explicitly specified[4] .

4.2 Explicit Power, participation in remote setting not specified

It should be recalled that this formulation is considered a "degraded" version of the previous one, and that its use should be avoided.

[2] Information exchanged under the System Services contract

[3] In a few specific cases, it may vary significantly during the day depending on the upstream reservoir's rating: in this case, an exchange with the order recipient may enable RTE to refine its vision of the actual setting possibilities.

[4] This volume of participation can be modified to fit the new point of operation.

In this type of operating point pass, only the desired value for the setpoint value to be produced by the EDA is indicated.

For example: 280 MW on EDA3

Participation (or non-participation) in the automatic frequency restoration setting must remain the same before and after the balancing order[5]. When the EDA has a zero forecast dispatch schedule before balancing, it participates in the automatic frequency restoration setting (with the level given by the operating point) if it is appropriate. Otherwise, it does not participate.

4.3 Delta power

This case is similar to the previous one, except that the new setpoint power is given as a deviation from the previous power.

For example:

300 MW on EDA4,

will lead the producer to set up a 300 MW overpower band relative to the previously planned schedule.

Participation (or non-participation) in the setting must remain the same before and after the balancing order[6]. When the EDA has a zero forecast dispatch schedule before balancing, the EDA participates in the automatic frequency restoration setting (with the level given by the operating point). Otherwise, it does not participate.

4.4 Case of hydroelectric pumped storage generation units

For hydroelectric handover pumped storage generation units:

- the use in pumping or turbine works must be systematically specified when the balancing is made by telephone (via TAO, this is specified by the choice of the EDA). However, in the event of an omission, the default turbine works will apply.
- the use of a "simultaneous pumping-turbine works" mode will be specified for EDAs allowing this. In this situation, the transmitted operating point will be pumped, with participation in the frequency containment and/or automatic frequency restoration settings.

5 Orders placed for EDAs of exchanger or consumer types

EDAs of the "exchanger" or "consumer" type do not participate in the frequency containment and automatic frequency restoration settings. Sent orders shall only include an indication of setpoint power.

[5] This volume of participation can be modified to fit the new point of operation.
[6] This volume of participation can be modified to fit the new point of operation.

6 Balancing orders

A balancing order is intended to amend the EDP schedule. It may be of a different nature:

- Balancing order with immediate effect
- Balancing order with deferred effect

6.1 Balancing orders with deferred effect

The purpose of a deferred balancing order is to request an amendment to the planned schedule of an EDA, at some point before the implementation of that amendment.

We will then note "time point", a moment in the day (for example 13:05). Typically, the time points used for the handover are multiples of 5.

6.1.1 Condition of use

RTE A delayed-effect order is passed at a time point P for an action to start at point P' (i.e. the start of the FAT), P' obviously being later than P. Following on from the principle that RTE passes balancing orders "as close as possible to real time" means that P cannot be too long before P'.

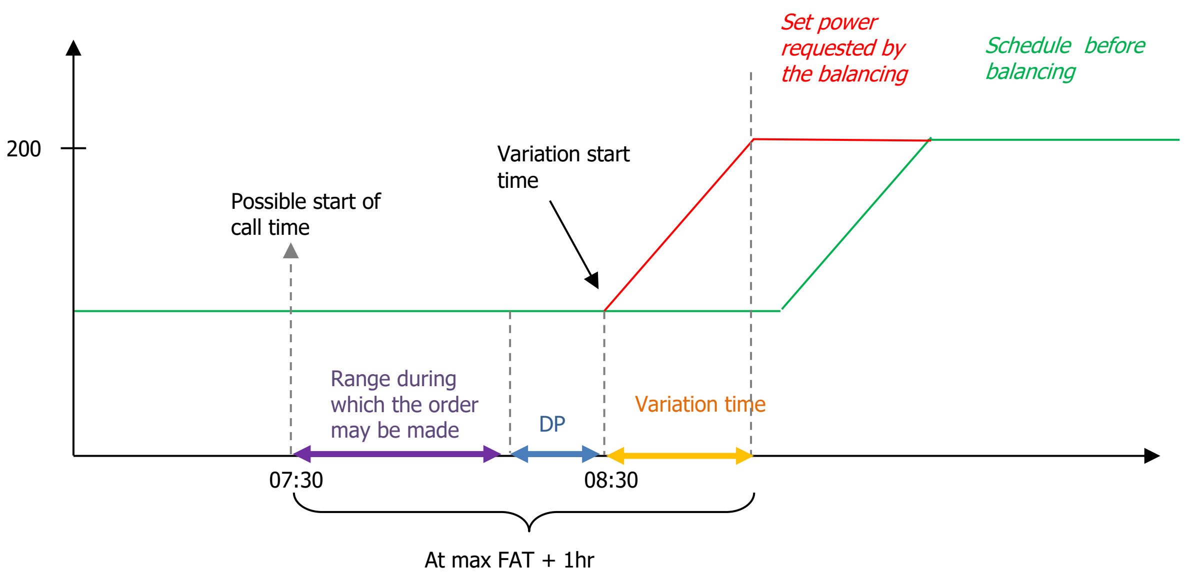
In practice, the slot in which a deferred-effect balancing operation can be passed is as follows:

- The practice of exploitation will endeavour to ensure that P and P' are not too close so as not to cause confusion with orders with immediate effect.
- P may not be earlier than [P'-1 hour].

<u>Example:</u>

The following order was made at 07:30:

From 08:30 to 10:00 <MAX.P2.S0, 200,20,20,0,0> (or <Pcmax,200,20,0>)



6.1.2 Cancellation of an order:

The cancellation of a balancing order is achieved by the transmission of a "counter-balancing operation", i.e. a new balancing order which gives the EDA setpoints identical to those assigned to it before the first balancing. There is therefore no "**Cancel**" order as such.

<u>Continued example</u>:

<u>Order</u>:

From 08:30 to 10:00 <MAX.P2.S0,200,20,20,0,0> (or <Pcmax,200,20,0>)

passed at 07:30 may be cancelled at 08:00 in the following order:

Return to Forecast Dispatch Schedule

6.1.3 "From" orders

These orders are expressed as follows:

As of <P_1> until <P_2> increase to <Operating point>

As of <P_1> until <P_2> decrease to <Operating Point>

As of <P_1> until <P_2> <Operating Point>

Or, equally:

From <P_1> up to <P_2> increase to <Operating Point>

From <P_1> up to <P_2> decrease to <Operating Point>

From <P_1> until <P_2> <Operating Point>

- **Increase** is used where the setpoint power required by the balancing order is greater than previously requested by the power unit (or plant);
- **Decrease** is used when the setpoint power requested by the balancing order is lower than that previously requested from the bay (or plant);
- finally, the third shape (without verb) can be used in all situations (even when the setpoint power is not modified[7]).

When the order requires a change in the setting setpoints, the setting setpoints must be implemented as soon as possible, starting at the time point P1.

<u>Example:</u>

At 08:30, the EDA XXX schedule specifies the operating point: **(600,20,20,0,0).** The following order shall be sent:

From 09:15 until 10:00 <MAX.P2.S2,560,20,20,40,40> (or <Pcomax,560,20,40>) of XXX

So, from 09:15 until 10:00, EDA XXX moves at the earliest to automatic frequency restoration setting, with a reserve set at 40.

[7] This may be the case with a change in participation in system services

When the order requires a change in the EDA's setpoint power, the load variation must begin as soon as possible, from point P1, and the set power must be reached at the latest at P1+variation time. The contractual slopes of load variation may not be strong enough to be able to reach the initial setpoint power in less than one ½ hour (at point $P)_1$) and final setpoint power (at point P_2). In this case, the quintuplets (or triplets) given for the ½ intermediate time points are optional and indicative; only quintuplets (or triplets) specified for the start and end points of the transition are prescriptive.

In the case of an EDA subject to compliance with the notice period, (EDA the generation of which is derived from gas), the notice period (DP) shall be predicted so that the change in load begins <P1>.

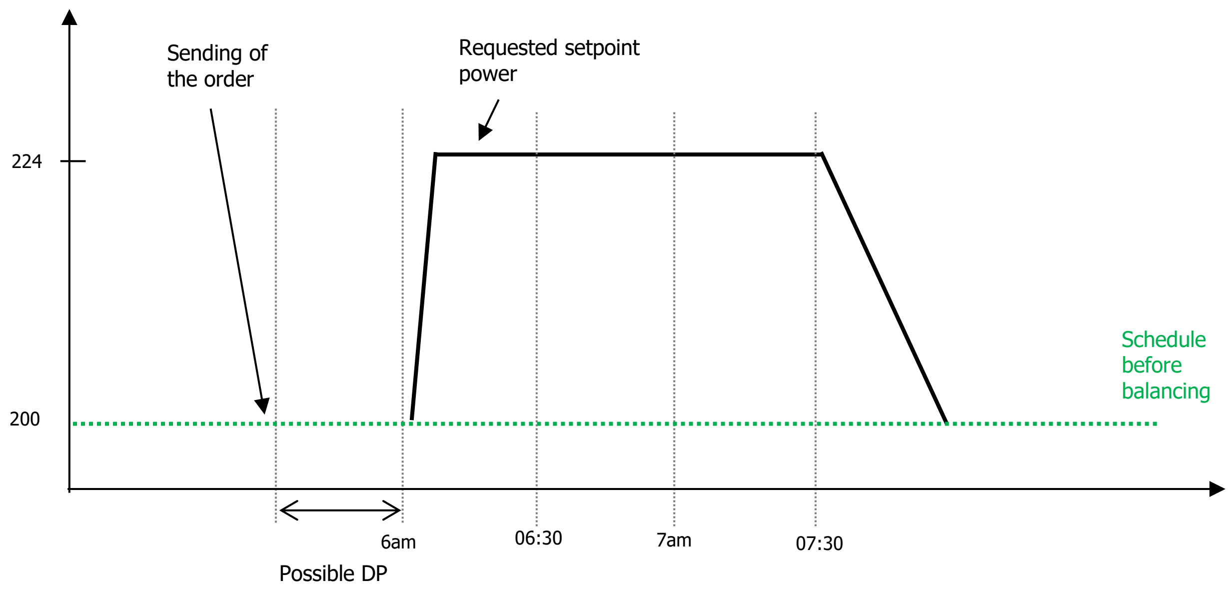
<u>Example of an upward modulation in less than half an hour:</u>

EDA YYY is about to start working **`<200,0,0,0,0> before 6:00.`** RTE sends the following balancing order:

`From 06:00 until 07:30 go to <MAX.P0.S0,224,0,0,0,0> (or<PMD,224,0,0>) on YYY`

If the EDA has the ability to modulate in less than 1/2 hour, the expected behaviour is as follows: As early as 06:01, the EDA starts to modulate as quickly as possible towards the setpoint, which can be reached in less than 1/2 hour.

If the EDA is subject to a notice period, the deadline is predicted so that the load change begins at 06:00. If the notice period is 10 minutes, it shall apply from 05:50.



<u>Example of an upward modulation in more than half an hour:</u>

The EDA ZZZ shall be ready for operation before 06.00 **<MIN.P0.S0,200,0,0,0,0> (or<MT,200,0,0>)**, RTE sends the following order:

From 06:00 until 08:30 go to <MAX.P0.S0,400,0,0,0,0> (or<PMD,400,0,0>) on ZZZ

Assuming this time that ZZZ's capabilities do not allow it to modulate within ½ hour, the expected behaviour is: from 06:01 ZZZ starts the transition towards **<MAX.P0.S0,400,0,0,0,0> (or <PMD,400,0,0>).** ZZZ may have reached this setpoint, for example, at about 06:40, and then maintain this policy until 08:30 as specified.

If the EDA is subject to a notice period, it is predicted so that the change in load begins at 06:00. If the notice period is 40 minutes, it shall apply from 05:20.

In some cases, the desired behaviour may be a "gentle slope" climb, i.e. below the minimum contractual slope; this situation is rare and is the subject of further discussion with the CNES, it is not dealt with in a normal order of the dialogue code.

6.2 Balancing order with immediate effect

The order must start to be executed ***as soon as it is accepted*** [8] (whether it is an upward or downward modulation).

When a balancing operation with immediate effect is in progress, the crossing of the hour 00:00 does not interrupt it implicitly. There is no automatic return to the forecast dispatch schedule: on the contrary, the balancing continues until it ends (in the case of a bounded adjustment) or it is explicitly interrupted by RTE in accordance with the following paragraphs:

- by an order returning to the forecast dispatch schedule,
- by another balancing operation,
- or when the schedule is joined in the particular case of the "Predict" order.

In the case of an EDA subject to compliance with the notice period, the notice period (DP) shall start to apply from the time of receipt of the order.

6.2.1 With the words "until further notice"

The orders "**`Increase`**", "**`Decrease`**", "**`Maintain`**", "**`Switch to`**" specify a point of operation that the EDA must reach as quickly as possible (if it is not already there). The term "**`until further notice`**" included in the order expression indicates that this point of operation must be complied with until a new balancing order is sent to amend it.

RTE uses this type of order when the operating conditions do not allow it to be aware of the necessary length of the balancing at the time the order is to be made.

To end an order of the "**`until further notice`**", type, RTE may ask the EDA to return to the Forecast Dispatch Schedule (see paragraph 6.2.3) or make a new balancing order (see 3.3).

The wording of these orders is as follows:

```
From now, Increase to <Operating Point> until further
notice

From now, Decrease to <Operating Point> until further
notice

From now, Maintain <Operating Point> until further notice

From now, Block <Operating Point> until further notice

From now, Skip to <Operating Point> until further notice
```

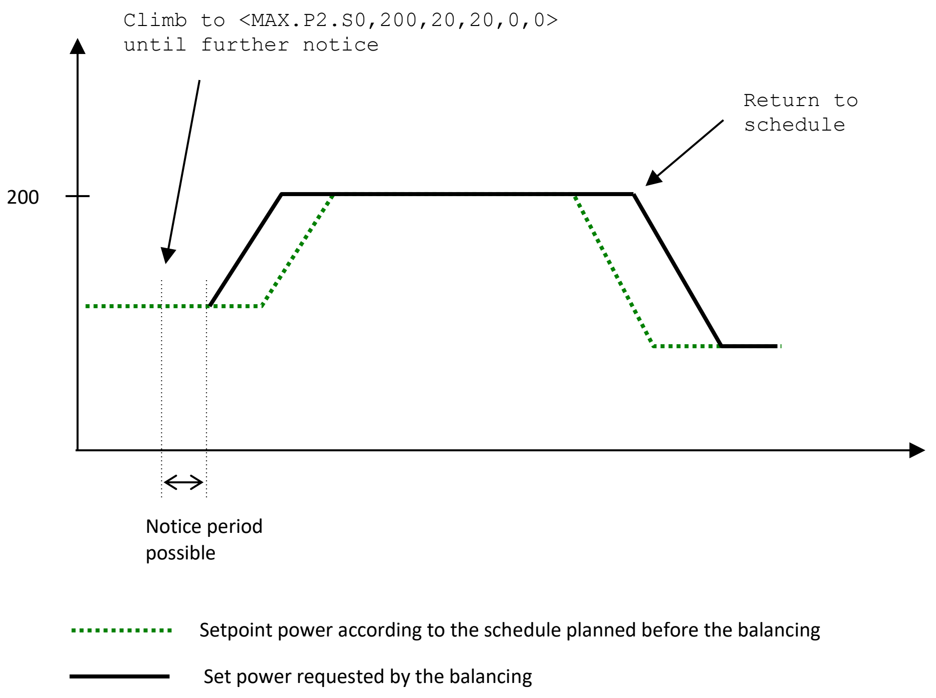
RTE uses "**`Increase`**", "**`Decrease`**", "**`Maintain`**" or "**`Block`**" respectively if the new operating point specifies a setpoint power, respectively, greater than, less than, or identical to, that of the operating point before the order is passed. Equally, "**`Switch to`**" can be used, which is always valid regardless of the value of the previous operating point.

[8] This is done within the necessary operating time limits: for example, a phase of preparation for the transition may be necessary — it is this phase of preparation that must begin as soon as the order is received.

For a delta balancing operation, "**`Climb from`**" or "**`drop from`**" are used

<u>Example:</u>

An balancing order for predicted increase includes the words "**`until further notice`**": the EDA remains on the setpoint set by the balancing order and does not make the decrease provided for in the Forecast Dispatch Schedule. The decline is subsequently triggered by a new balancing order.



6.2.2 With explicit finish date (restricted balancing)

When making an immediate order and being aware of the duration of the balancing operation, the following formulations may be used:

`From now, Increase to <Operating Point> up to <P1>`

`From now, Lower to <Operating point> up to <P1>`

`From now Maintain <Operating point> up to <P1>`

`From now Block at <Operating point> up to <P1>`

`From now, Move to <Operating point> up to <P1>`

As soon as the time point P1 has been crossed, the EDAs concerned shall return as soon as possible to the planned forecast dispatch schedule, as soon as possible after acceptance of the order, within the time limits necessary for the management of the transition.

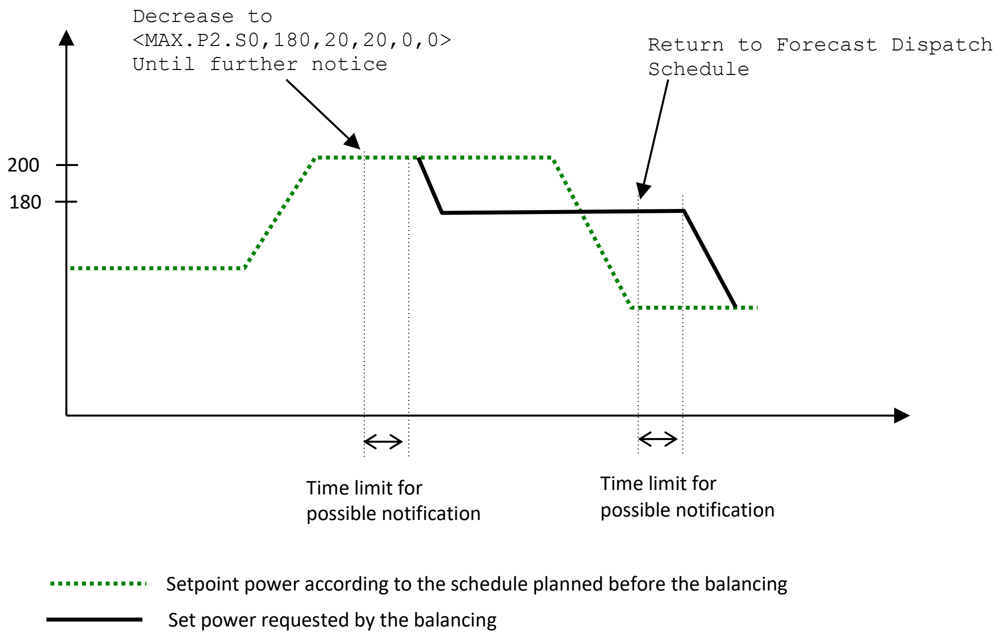
6.2.3 Return to Forecast Dispatch Schedule

The order "**Return to Forecast Dispatch Schedule**" is used to terminate an ongoing balancing operation and all possible deferred balancing operations already transmitted that would have taken effect later.

The EDA returns to the last redeclared forecast dispatch schedule as soon as possible (from the acceptance of the order, within the time required for the management of the transition). The order is worded as follows:

From now, back to the forecast dispatch schedule on ZZZ

In the case of an EDA subject to compliance with the notice period, the notice period (DP) shall start to apply from the time of receipt of the order.



Note: the order sent by TAO does not necessarily specify the operating point (values for power, RP and RS equal to 9999).

6.2.4 Predict

When an EDA[9] has to make an up or down modulation, a balancing operation may request an immediate prediction of this modulation — this may be required by the last redeclared schedule or by a deferred balancing operation.

The order is as follows:

Predict the increase [to <Operating Point>] on <EDA>

Predict the decrease [to <Operating Point>] on <EDA>

[9] Interpreted as the sum of the constituent EDP schedules where appropriate

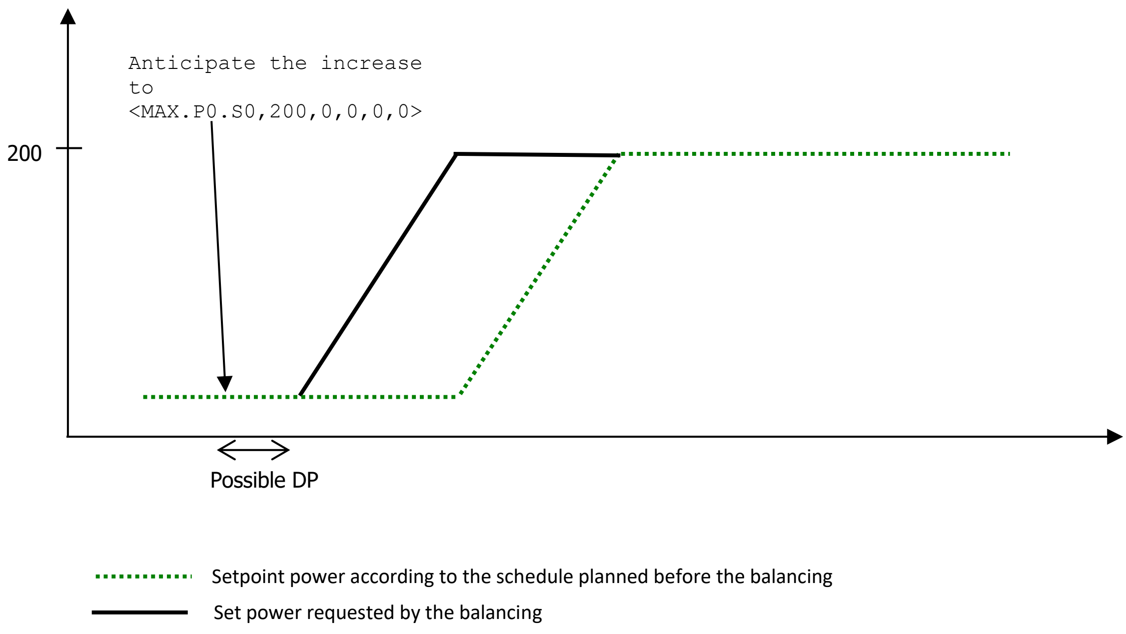
The square brackets [] indicate that the point of operation to be reached after the increase or decrease is not necessary for the order to be made. However, the receiver of the order may ask RTE to remove any ambiguity. The balancing shall cease as soon as the date originally planned for modulation is reached.

Note: the order sent by TAO shall specify the operating point and the end time.

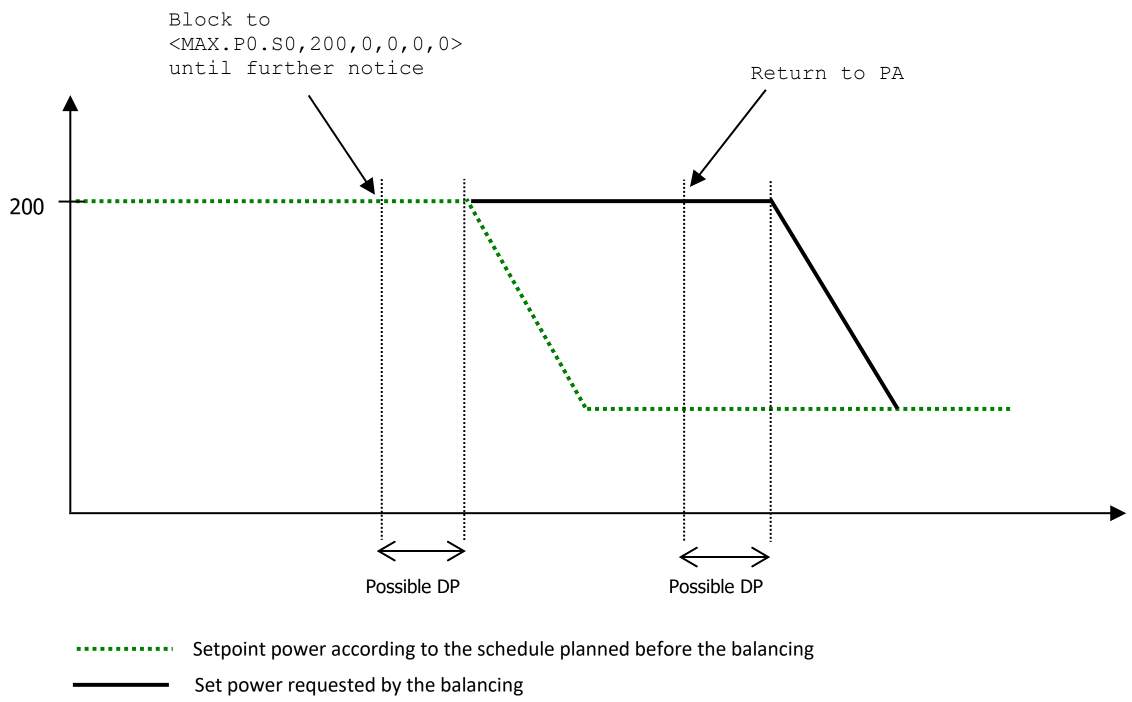
Example:

Anticipate the increase at <MAX.P0.S0,200,0,0,0,0> (or <PMD,200,0,0>) until 07:15

Example of an order of the "**Anticipate**" type



<u>Example of a "**block**"-type order followed by a return to the Forecast Dispatch Schedule:</u>



6.3 Specific market coupling cases and generation unit decoupling

When a generation unit has to connect to the network, the information that is important for the operation is not the actual time of market coupling, but the time from which the generation unit can effectively debit the desired setpoint power. The order is thus formulated as follows:

Market coupling of <EDA> to reach <Operating Point> at <P'_1>

If RTE wants to know the actual time of market coupling, it can ask the producer to provide the information in return as soon as possible (not necessarily immediately).

In the case of decoupling, RTE specifies the time at which the generation unit starts its decoupling in order to decouple. The actual decoupling time may be requested from the producer in return when the order is sent to it:

Immediately Decrease in view of <EDA> From <P_2> Decrease in view of <EDA>

<u>Examples</u>:

- The EDA ZZZ market coupling must enable it to produce <MAX.P2.S0,250,20,20,0,0> (or<Pcmax,250,20,0>) from 08:00:

  ZZ market coupling to reach <MAX.P2.S0,250,20,20,0,0)> (resp.Pcmax,250,20,0>) at 08:00

- YYY starts its decrease at 19:00 to stop:

  From 19:00, Decrease with view to stop YYY

6.4 Superimposed balancing orders

This paragraph sets out the expected behaviour of an EDA when RTE issues a new balancing order for a previously adjusted time slot. For this purpose we will distinguish several cases, depending on the nature of the initial balancing and the new order received:

- The initial balancing is unrestricted and the new balancing is restricted;
- The initial balancing and the new balancing are limited;
- The initial balancing is restricted and the new balancing is a "**UFN**" without an end date,
- The initial balancing is restricted and the new balancing is a "**return to the forecast dispatch schedule**".

It should be recalled that a restricted balancing operation is a balancing operation whose effect is explicitly or implicitly restricted in time when transmitted. This category therefore includes the following orders:

- **As of <P1> until <P2>...**
- **From <P1> until <P2>...**
- **Market coupling**
- **From <P2> Decrease with view to stop...**
- **From now,... until <P2>**
- **Predict...**

Note: standard balancing operations are considered narrow balancing operations.

By contrast, the only unrestricted balancing operations are:

- **From now... until further notice**
- **Return to Forecast Dispatch Schedule**
- **Block**
- **Maintain**

In summary, the principles outlined in the following paragraphs are as follows:

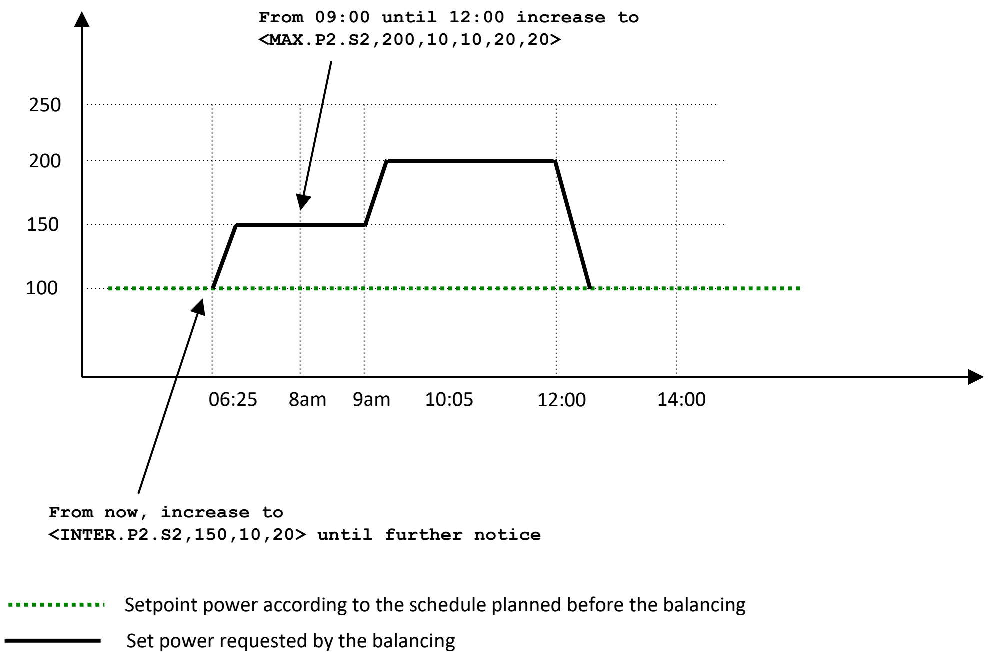
- A new restricted balancing operation overwrites a possible restricted balancing operation or JNA previously passed on the only intersecting time slot;
- An "until further notice" order overrides all previous balancing operations; The end of the JNA implies a return to the PA, even if the original order had a later end;
- A "return to the forecast dispatch schedule" order overrides all previous balancing operations.

6.4.1 The initial balancing is unrestricted and the new balancing is restricted;

Sending a new balancing operation closes the balancing operation in hand as soon as the transition corresponding to this new balancing commences.

Example (without notice period):

- The forecast dispatch schedule is constant at 100 MW.
- At 06:25 RTE issues an immediate order for a rise to <INTER.P2.S2,150,10,10,20,20> (or<Pc0inter,150,10,20>) until further notice.
- At 08:00, RTE passes a deferred balancing order for an increase to 200 MW from 09:00.



From 08:00 to 09:00, the EDA remains in a balancing operation at 150 MW, as requested by the first order. At 9:00 it starts the increase transition corresponding to the second balancing operation, and simultaneously the first balancing order is closed. At 12:00, the second balancing operation stops and the EDA returns to its forecast dispatch schedule, the first balancing operation being closed.

6.4.2 The original balancing and the new balancing are limited

In this case, the order that came last predominates and cancels the previous order only on the intersection part of the time slots.

This implies in particular that when the second balancing ceases, the first shall apply if its hourly range has not yet been achieved.

Example (without notice period):

Suppose that the initial schedule of EDA XXX is as follows:

Active power of 150 MW from 06:00 until 12:00

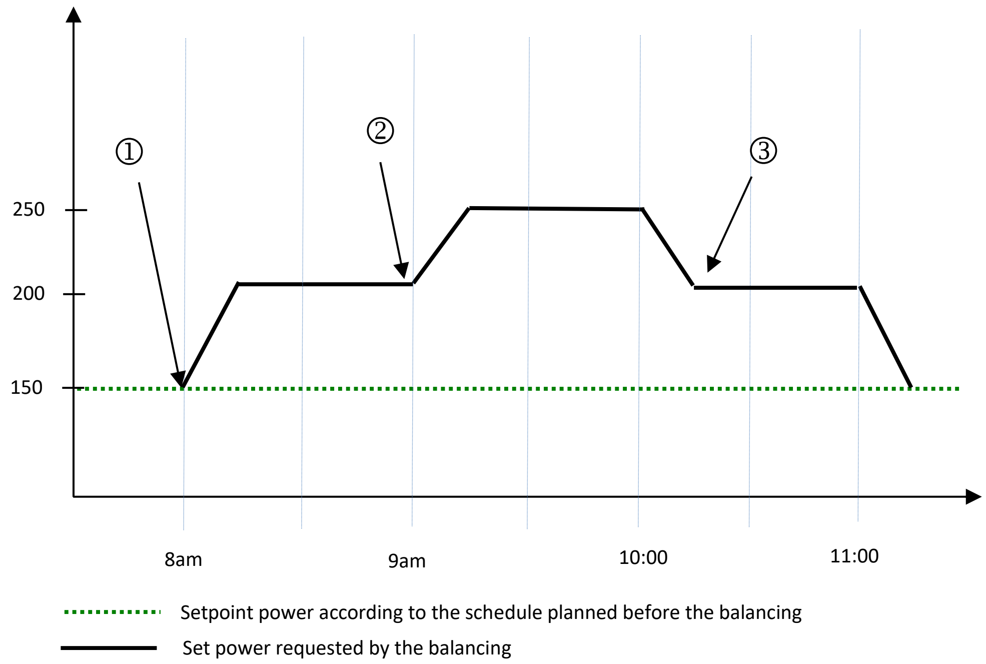
At 07:00, RTE passes the following balancing operation:

From 08:00, Increase to <MAX.P2.S2,200,20,20,30,30> (or<Pcomax,200,20,30>) until 11:00

Then at 08:00, RTE transmits the new balancing order

From 09:00, Increase to <MAX.P0.S0,250,0,0,0,0> (or<PMD,250,0,0>) until 10:00

The expected behaviour will then be as follows:



In①: the EDA shall enter the transition period corresponding to the first balancing order.

In②: transitional for the second balancing.

In ③, at 10:00, the EDA returns to the point of operation prescribed by the first balancing operation whose time slot is not finished as it lasts until 11:00.

6.4.3 Initial restricted balancing and new unrestricted balancing

An unrestricted balancing operation wipes out all previously reported balancing operations. In particular, if the unrestricted balancing is interrupted, any deferred balancing that would have been passed before becomes ineffective.

Example (without notice period):

Case of prediction for lack of system service, followed by a decrease until further notice to ensure supply - demand balance.

In its forecast dispatch schedule, the EDA XXX is planned at maximum available power <MAX.P0.S0,250,0,0,0,0>, then on the interval 18:00 (]17:30; 18h00]) passes as frequency setting <MAX.P2.S2,220,10,10,20,20>.

Due to a lack of system services found throughout the generation fleet, a first balancing operation ① passed at 14:00 allows prediction of the setting of EDA XXX being passed:

Anticipate the decrease to <MAX,P2.S2,220,10,10,20,20> (or<Pcomax,220,10,20>) on XXX

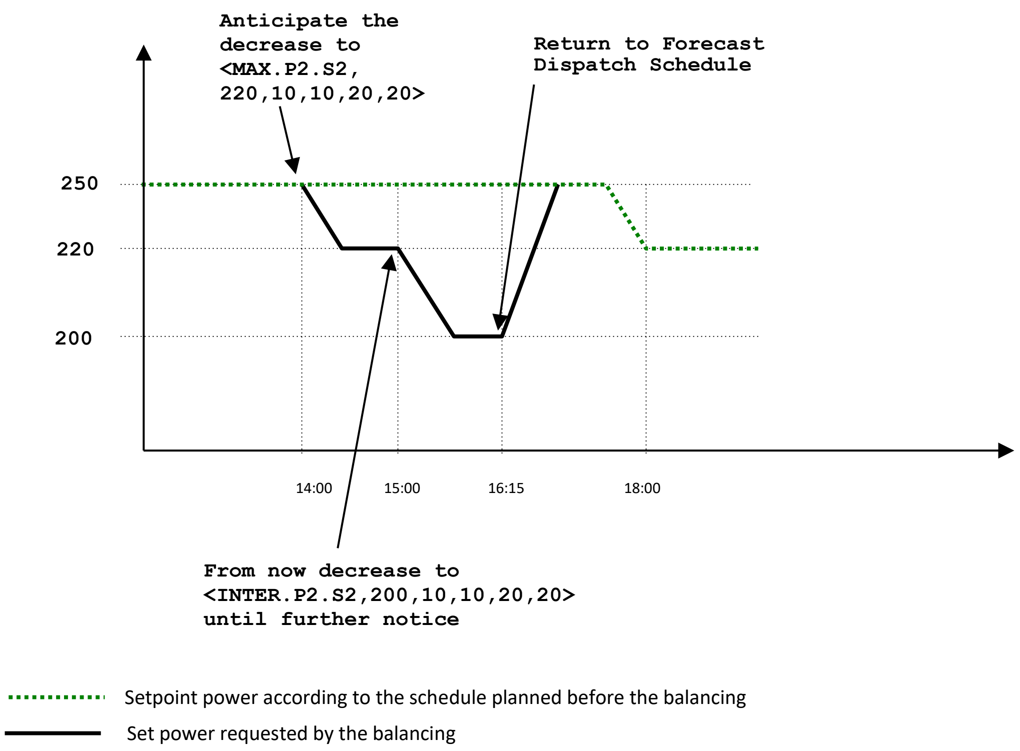
A second balancing operation ② is passed at 15:00 to adjust the demand balance following an afternoon trough more marked than expected:

From now, decrease to <INTER.P2.S2,200,10,10,20,20> (or<Pc0inter,200,10,20>) until further notice

At 16:15, following the loss of a generation unit, the decrease must be halted for EDA XXX; RTE then sends the order③:

Return to Forecast Dispatch Schedule

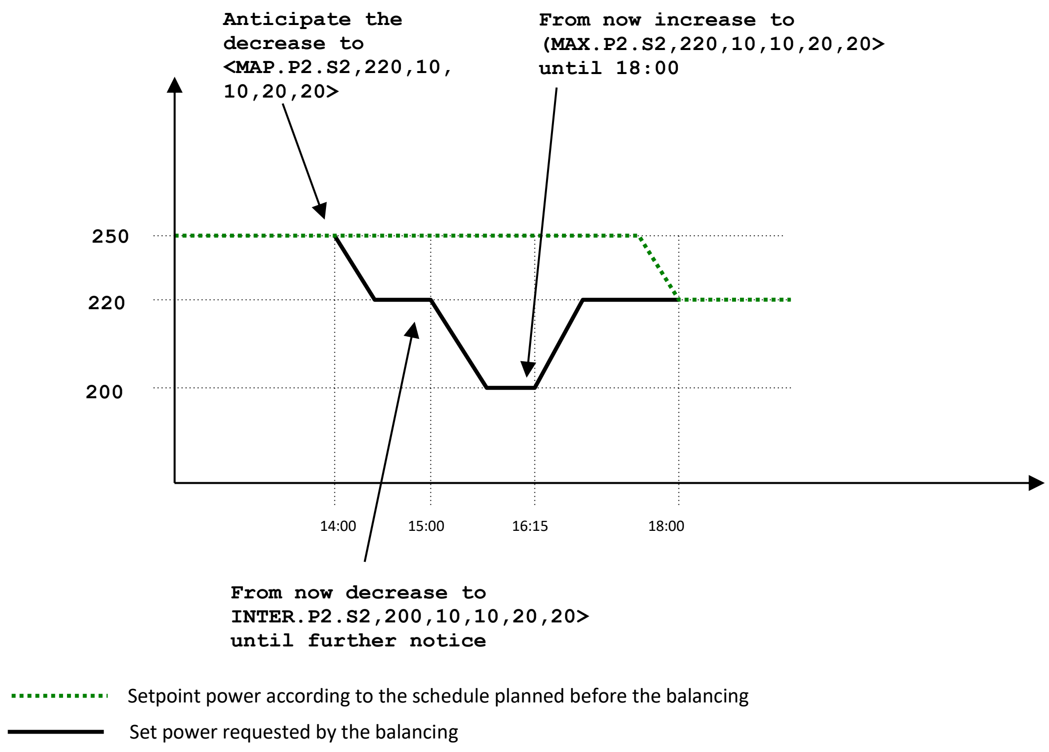
The open-ended balancing ② ceases, and any balancing previously placed on EDA XXX is no longer valid, including balancing ①. Accordingly, the EDA reverts to its originally planned Forecast Dispatch Schedule, i.e. to the point of operation <MAX.P0.S0,250,0,0,0,0> (or <PMD,250,0,0>). The switch to frequency setting will be on the 18:00 interval, as specified by the forecast dispatch schedule.



If at 16:15 RTE wishes to put an end to the decrease requested at 15:30, while retaining the advance setting requested at 14:00, RTE must make an explicit order including the quintuplet:

From now increase to <MAX.P2.S2,220,10,10,20,20> (or<Pcomax,220,10,20>) until 18:00

The balancing stops at 18:00 and the EDA then resumes the schedule.



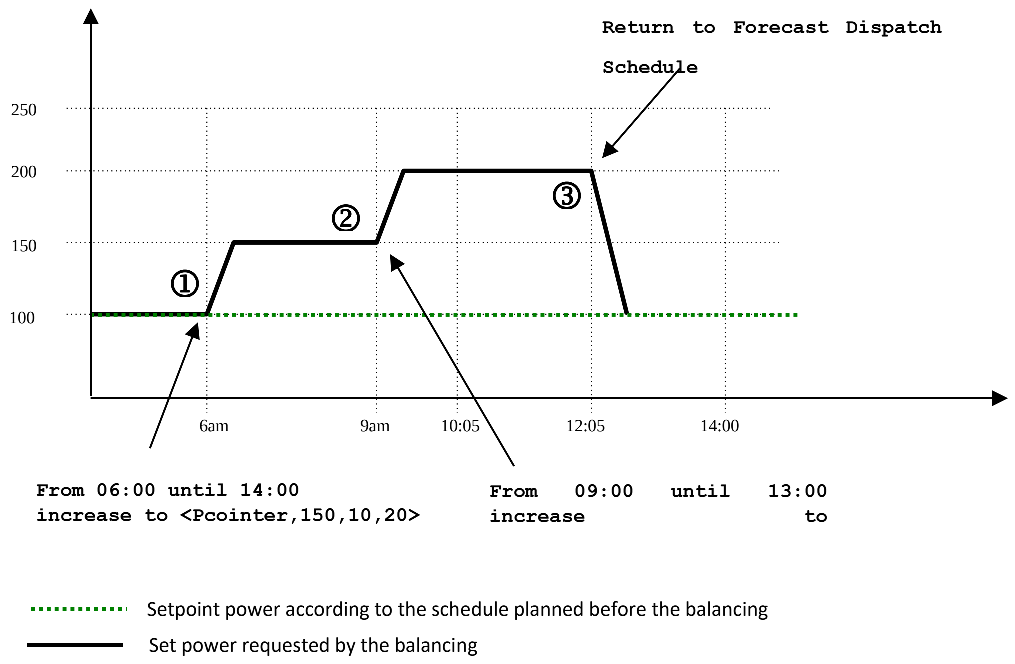
6.4.4 The new balancing received is a return to the forecast dispatch schedule

This order is sent to request a return to the last redeclared forecast dispatch schedule. It therefore interrupts not only any balancing in progress, but also all possible deferred balancing operations previously requested whose time range is not yet completed.

Example (without notice period):

The initial schedule is constant at <MAX.P2.S2,100,10,10,20,20> (or <Pcomax,220,10,20>)

- **Order ① passed at 05:03: From 6:00 until 14:00 increase to <INTER.P2.S2,150,10,10,20,20> (or<Pc0inter,150,10,20>)**
- **Order ② passed at 08:04: From 09:00 until 13:00 increase to <PC0max,200,20,30> <MAX.P2.S2,200,20,20,30,30> (or<Pcomax,200,20,30>)**
- **Order ③ passed at 12:06: Return to Forecast Dispatch Schedule**



Order ③ not only interrupts the order ②, but also order ①, which however covers an hourly range up to 14:00.

7 References

[1] BRE-Balance Mechanism rule

[2] TAO Implementation Guide and TAO Support Guide

These documents can be accessed via the following link:

[Becoming a balancing service provider - RTE Services Portal (services-rte.com)]

8 Glossary

CCP (Generation Operation Centre): The physical entity of a producer acting directly on the controls of one or more Scheduling Entities.

Derating: This term applies to generator sets consisting of two thermal generation units, dependent on each other, where frequency response dynamics of the second are significantly slower than those of the first.

DP (Notice Period): Minimum time between the telephone notification of GRTgaz by the producer of the modified schedule of gas-powered generation of a quantity greater than or equal to Flexibility Tolerance and the beginning of its effective implementation by the producer.

FAT (Full Activation Time)**:** Deadline required to activate an Offer by an EDA

EDP (Generation Entity): Elemental scheduling unit corresponding to one or more Generation Units of an Injection Site Connected to the RPT or, if applicable, the RPD, for which a Forecast Dispatch Schedule is established by a Scheduling Agent.

EDA (Balancing Entity): An elemental unit of balancing, consisting of one or more geographically localised EDPs or one or more Extraction Points or Exchange Points, capable of responding to an RTE demand intended to inject or extract a given amount of power on the Network for a given period of time.

ITR (Real Time Contact): Entity that ensures Real Time interactions with RTE on behalf of a Producer. In particular, this entity receives balancing orders sent by RTE and transmits them to the relevant CCPs.

Order recipient: Individual designated under the scheduling* and/or Balancing to receive schedules* and/or Balancing Orders

9 Appendix: correspondence between the old and the new implicit code.

New name	Old name	Power level	RPh	RPb	RSh	RSb
MAX.P0.S0	PMD	**Pmax**	0	0	0	0
MAX.P0.S2		**Pmax**	0	0	RS	RS
MAX.P0.S3		**Pmax**	0	0	RS	0
MAX.P0.S1		**Pmax**	0	0	0	RS
MAX.P0.S2+		**Pmax**	0	0	RSMAX	RSMAX
MAX.P0.S3+		**Pmax**	0	0	RSMAX	0
MAX.P0.S1+		**Pmax**	0	0	0	RSMAX
MAX.P2.S0	PCmax	**Pmax**	RP	RP	0	0
MAX.P2.S2	PC0max	**Pmax**	RP	RP	RS	RS
MAX.P2.S3		**Pmax**	RP	RP	RS	0
MAX.P2.S1		**Pmax**	RP	RP	0	RS
MAX.P3.S0		**Pmax**	RP	0	0	0
MAX.P3.S2		**Pmax**	RP	0	RS	RS
MAX.P3.S3		**Pmax**	RP	0	RS	0
MAX.P3.S1		**Pmax**	RP	0	0	0
MAX.P1.S0		**Pmax**	0	RP	0	0
MAX.P1.S2		**Pmax**	0	RP	RS	RS
MAX.P1.S3		**Pmax**	0	RP	RS	0
MAX.P1.S1		**Pmax**	0	RP	0	RS
MAX.P2+.S0	PcRPmax	**Pmax**	RPMAX	RPMAX	0	0
MAX.P3+.S0		**Pmax**	RPMAX	0	0	0
MAX.P1+.S0		**Pmax**	0	RPMAX	0	0
MAX.PX.S0		**Pmax**	RPMAX	RP	0	0
MAX.PX.S0		**Pmax**	RP	RPMAX	0	0
MAX.P3+.S1		**Pmax**	RPMAX	0	0	RS
MAX.P1+.S3		**Pmax**	0	RPMAX	RS	0
MAX.PX.S1		**Pmax**	RPMAX	RP	0	RS
MAX.PX.S3		**Pmax**	RP	RPMAX	RS	0

New name	Old name	Power level	RPh	RPb	RSh	RSb
INTER.P0.S0	Plim	**Pinter**	0	0	0	0
INTER.P0.S2		**Pinter**	0	0	RS	RS
INTER.P0.S3		**Pinter**	0	0	RS	0
INTER.P0.S1		**Pinter**	0	0	0	RS
INTER.P0.S2+		**Pinter**	0	0	RSMAX	RSMAX
INTER.P0.S3+		**Pinter**	0	0	RSMAX	0
INTER.P0.S1+		**Pinter**	0	0	0	RSMAX
INTER.P2.S0	PCinter	**Pinter**	RP	RP	0	0
INTER.P2.S2	PC0inter	**Pinter**	RP	RP	RS	RS
INTER.P2.S3		**Pinter**	RP	RP	RS	0
INTER.P2.S1		**Pinter**	RP	RP	0	RS
INTER.P3.S0		**Pinter**	RP	0	0	0
INTER.P3.S2		**Pinter**	RP	0	RS	RS
INTER.P3.S3		**Pinter**	RP	0	RS	0
INTER.P3.S1		**Pinter**	RP	0	0	RS
INTER.P1.S0		**Pinter**	0	RP	0	0
INTER.P1.S2		**Pinter**	0	RP	RS	RS
INTER.P1.S3		**Pinter**	0	RP	RS	0
INTER.P1.S1		**Pinter**	0	RP	0	RS
INTER.P2+.S0	PcRPmax inter	**Pinter**	RPMAX	RPMAX	0	0
INTER.P3+.S0		**Pinter**	RPMAX	0	0	0
INTER.P1+.S0		**Pinter**	0	RPMAX	0	0
INTER.PX.S0		**Pinter**	RPMAX	RP	0	0
INTER.PX.S0		**Pinter**	RP	RPMAX	0	0
INTER.P3+.S1		**Pinter**	RPMAX	0	0	RS
INTER.P1+.S3		**Pinter**	0	RPMAX	RS	0
INTER.PX.S1		**Pinter**	RPMAX	RP	0	RS
INTER.PX.S3		**Pinter**	RP	RPMAX	RS	0

New name	Old name	Power level	RPh	RPb	RSh	RSb
MIN.P0.S0	TM	**Pmin**	0	0	0	0
MIN.P0.S2		**Pmin**	0	0	RS	RS
MIN.P0.S3		**Pmin**	0	0	RS	0
MIN.P0.S1		**Pmin**	0	0	0	RS
MIN.P0.S2+		**Pmin**	0	0	RSMAX	RSMAX
MIN.P0.S3+		**Pmin**	0	0	RSMAX	0
MIN.P0.S1+		**Pmin**	0	0	0	RSMAX
MIN.P2.S0		**Pmin**	RP	RP	0	0
MIN.P2.S2	PC0min	**Pmin**	RP	RP	RS	RS
MIN.P2.S3		**Pmin**	RP	RP	RS	0
MIN.P2.S1		**Pmin**	RP	RP	0	RS
MIN.P3.S0		**Pmin**	RP	0	0	0
MIN.P3.S2		**Pmin**	RP	0	RS	RS
MIN.P3.S3		**Pmin**	RP	0	RS	0
MIN.P3.S1		**Pmin**	RP	0	0	RS
MIN.P1.S0		**Pmin**	0	RP	0	0
MIN.P1.S2		**Pmin**	0	RP	RS	RS
MIN.P1.S3		**Pmin**	0	RP	RS	0
MIN.P1.S1		**Pmin**	0	RP	0	RS
MIN.P2+.S0	PcRPmax min	**Pmin**	RPMAX	RPMAX	0	0
MIN.P3+.S0		**Pmin**	RPMAX	0	0	0
MIN.P1+.S0		**Pmin**	0	RPMAX	0	0
MIN.PX.S0	PCmin	**Pmin**	RPMAX	RP	0	0
MIN.PX.S0		**Pmin**	RP	RPMAX	0	0
MIN.P3+.S1		**Pmin**	RPMAX	0	0	RS
MIN.P1+.S3		**Pmin**	0	RPMAX	RS	0
MIN.PX.S1		**Pmin**	RPMAX	RP	0	RS
MIN.PX.S3		**Pmin**	RP	RPMAX	RS	0

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