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TAO Implementation guide

WARNING

The French version of this document (available at http://clients-rte-france.com/) prevails in the event of contradiction with the English version

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CONTENTS

1. General provisions

1.1. Purpose of the document

This document is intended for users of the Automated Order Transmission system (TAO) for balancing operations implemented by RTE. This system is implemented to transmit all Balancing Operation Orders and it is therefore intended for all Balancing Service Providers and local distribution grid sites (GRD[1]).

This document forms an integral part of the IT Rules and define:

- the process of transmission of balancing operation orders associated with the TAO system
- the technical methods to be implemented for using the TAO system.

1.2. Reference documents

The table below lists the reference documents quoted in this implementation guide:

No.	Document title	Source
[1]	General IS Appendix	https://www.services-rte.com/fr/conditions-generales-d-utilisation.html
[2]	PKI Software Certificate User Manual	https://easypki.rte-france.com/en/
[3]	TAO System: implementation methods associated with operating processes	https://www.services-rte.com/en/learn-more-about-our-services/becoming-a-balancing-service-provider.html
[4]	Technical specifications for access IP-VPN TAO service	https://www.services-rte.com/en/learn-more-about-our-services/becoming-a-balancing-service-provider.html
[5]	TERRE Project	https://www.services-rte.com/en/learn-more-about-our-services/becoming-a-balancing-service-provider.html

This implementation guide (French version) prevails in the event of contradiction with these reference documents.
This implementation guide in French version prevails in the event of contradiction with the English version.

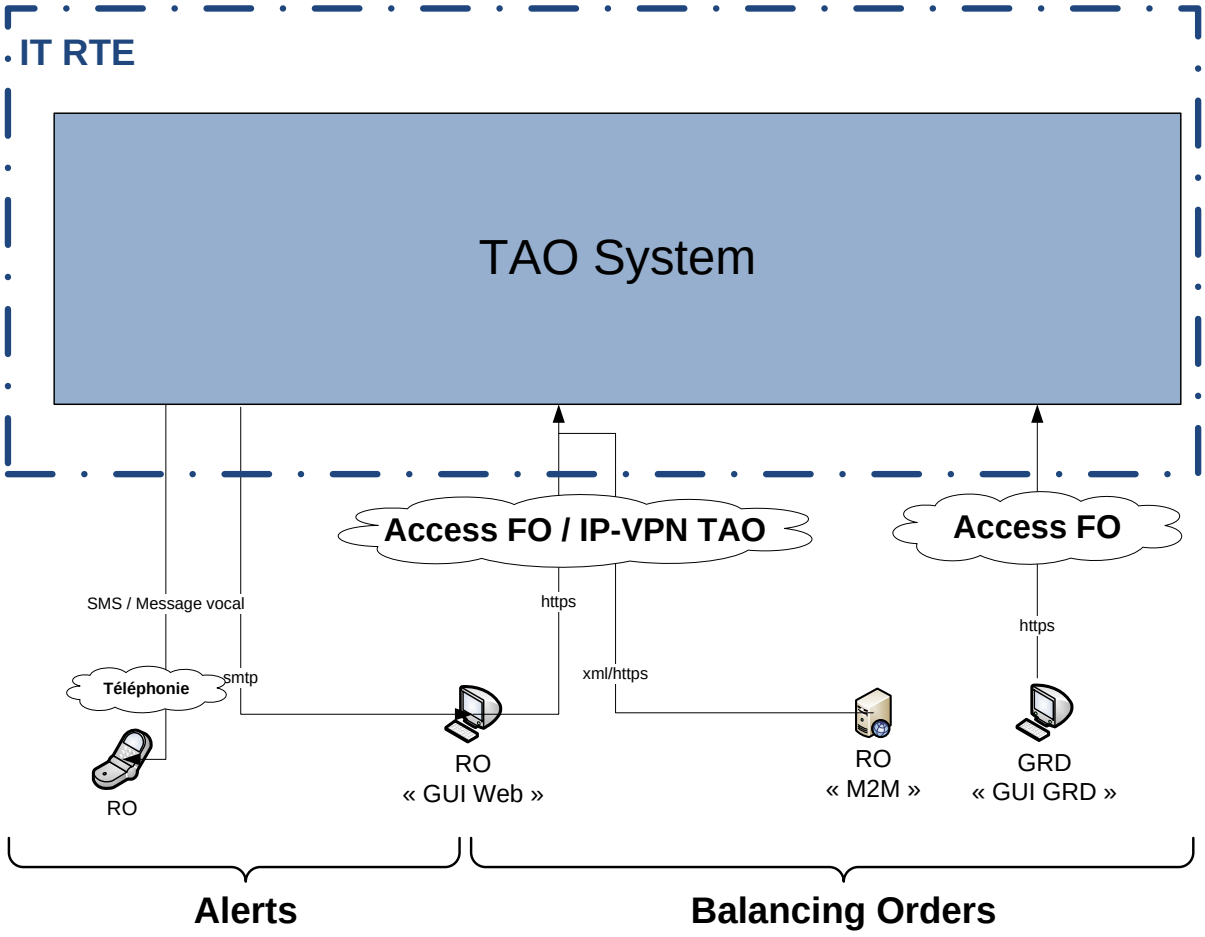
[1] French abbreviation for local electricity distribution companies.

1.3. Changes to the technical specifications

Each of the technical specifications defined in this document may be revised at the initiative of RTE. Unless stated otherwise regarding timescales, these revisions are Notified to Users at least six (6) months before their operational commissioning.

2. TAO system architecture

The diagram below presents the overall architecture of the TAO system.



2.1. Interfacing solutions

For any Recipient Order (RO), there are two solutions for interfacing with the TAO system, namely:

An interface known as "Web GUI":

This interface should only be implemented by ROs only having offers that meet the "long dynamic" criteria (see article 3).

Technically, the interface provides an access to a RTE website. The RO can carry out the following operations: consultation of balancing orders issued by RTE, sending to RTE of the acceptance or rejection of activation of a balancing order.

The details for implementation are presented in article 4.

A "Machine to Machine" (M2M) interface:

This interface should be implemented by any RO having at least one offer meeting the "short dynamic"[2] criteria (see article 3), and could be implemented by all ROs (including those that only have BE in which the DMO is higher than 30 minutes).

This interface is technically made up of:

- A service allowing reception of the balancing orders sent by RTE (consultation of balancing orders).
- A service allowing to send replies regarding these balancing orders (sending of replies for acceptance or rejection of activation of the balancing orders),
- a service to send Final Dispatch schedules (PM) for accepted balancing orders.

Details of the implementation of this interface are presented in article 5.

For any GRD, there is a specific solution for interfacing with the TAO system, namely "GRD GUI":
Technically, the interface provides an access to a RTE website. The GRD can consult balancing orders issued by RTE concerning its distribution network and accepted by ROs.

2.2. RTE IT access solutions

The TAO system can be accessed via the RTE Front Office.

The RTE Front Office is the gathering of all electronic media proposed by RTE to access to its IT and the Applications.

There are two ways to access the TAO application:

1. TAO VPN IP Access: this access method is both mandatory and reserved for ROs responsible for at least one balancing offer under a Rapid Reserves / Supplementary Reserves contract.

   The TAO VPN IP only gives access to the TAO system.

   To request TAO VPN IP access, please contact your Customer Relationship Officer (CRC). The user must allow a period of approximately one quarter between the request and the operation of the telecommunication link. This time limit is not guaranteed for sites outside France.

2. Internet access: this access mode is possible for everyone (RO and Distribution System Operator). It is recommended to ROs as a standby mode for other access modes.

[2] Obviously, any RO offering at least one offer on the TERRE platform must implement an "M2M" type interface.

Environmental specifications on the ROs site:

The access connection to the TAO IP VPN TAO on the ROs site is made by means of one or more network access operator equipments, supplied by the Third party on behalf of and under the responsibility of RTE.

The RO undertakes to make available to RTE and the Third party, a sheltered, fitted-out and dust-free room for installing the equipment (Operator equipment).

The RO undertakes to provide free access to this room for employees of RTE and the Third party.

Generally, the fitting-out of the room must comply with best practices and allow normal conditions for assembly and maintenance of the Third party's equipment. In particular, the RO will ensure that they observe the following points:

- The equipment will not be installed near a heat source and the RO will ensure that the equipment ventilation systems are not obstructed.
- The ambient temperature in the room will be between +15 and +30°C.
- The humidity in the room will be between 10% and 90% uncondensed.

The RO will make a Telecom cabinet available in the room fitted with emplacement for installation of operator equipment. The Telecom cabinet will be connected to the site grounding system and fitted with a grounding panel for operator equipment and a RJ45 socket panel.

The RO will make a AC 230 V emergency power supply available on its site in accordance with the standards in effect in France or the concerned country, through the intermediary of a sufficient number of power sockets in the Telecom cabinet. The power supply features of the equipment are detailed below for information purposes: 230V power socket ~ uninterrupted or emergency-supplied HQ: 1 - Consumption: 100-240 VAC / 60 W.

The RO will provide additional 230V sockets for test equipment for use near the Telecom cabinet.

The RO will install a Telecom socket in the ROs site Telecom room, distributor type, for the TAO IP VPN access. Wiring will be installed from this distributor to the panel of RJ45 sockets installed in the Telecom cabinet.

The RO will install all computers and network wiring on its site, as well as the electrical wiring necessary for the connection: operator equipment – insulated site entry.

The cables used for digital data connections will generally be twisted pair, shielded and at least category 5. It is recommended to use cables with braided shields (STP or SFTP) including for the Ethernet cables (the FTP aluminum strip screen is not suitable). The connectors will be metallic or metalized to ensure electrical continuity whenever possible.

By application, the RJ45 cables used to connect the various items of equipment will be at least category 5 type, according to standard EIA/ TIA 568.

Technical details are given in the reference document [4]. The information provided in this document provides the necessary prerequisites for the implementation of the IP VPN. Once the equipment installed on costumer's site, a test will be scheduled with the costumer in order to test the backup mode of IP VPN switch (a backup switch is indeed available on costumer's site).

2.3. Three additional alert systems to ROs

The TAO system generates three types of alerts that inform the RO about the transmission of one or more balancing orders concerning Balancing Entities that are attached to it. Therefore on the emission of one or more balancing orders by the TAO system:

- An e-mail is sent to one or two addresses (maximum) defined by the RO affected by the balancing order(s). This e-mail states the date and time of transmission of the balancing order(s), and the identifier(s) of the balancing order[3]. An example of the message included in this type of e-mail is shown below:

  A (some) balancing order(s) has (have) been made available to the RO [Name of the OR] on the TAO platform on [DD/MM/YYYY] at [hh:mm:ss]. The ID(s) of this (these) order(s) is (are):

  - *[First order ID],*
  - *[Second order ID],*
  - …
  - *[Nth order ID].*

- A voice message is sent to one or two telephone numbers (maximum) defined by the RO affected by the balancing order. This message states the date and time of transmission of the balancing order(s)[24]. An example of the message included in this type of voice message is shown below:

  "A (some) balancing order(s) has (have) been made available to the RO [Name of the OR] on the TAO platform on [DD/MM/YYYY] at [hh:mm:ss]."

- A SMS is sent to one or two telephone numbers (maximum) defined by the RO affected by the balancing order. This SMS states the date and time of transmission of the balancing order(s)[35]. An example of the SMS is shown below:

  One or several balancing orders have been made available on the TAO platform on [DD/MM/YYYY] at [hh:mm:ss].

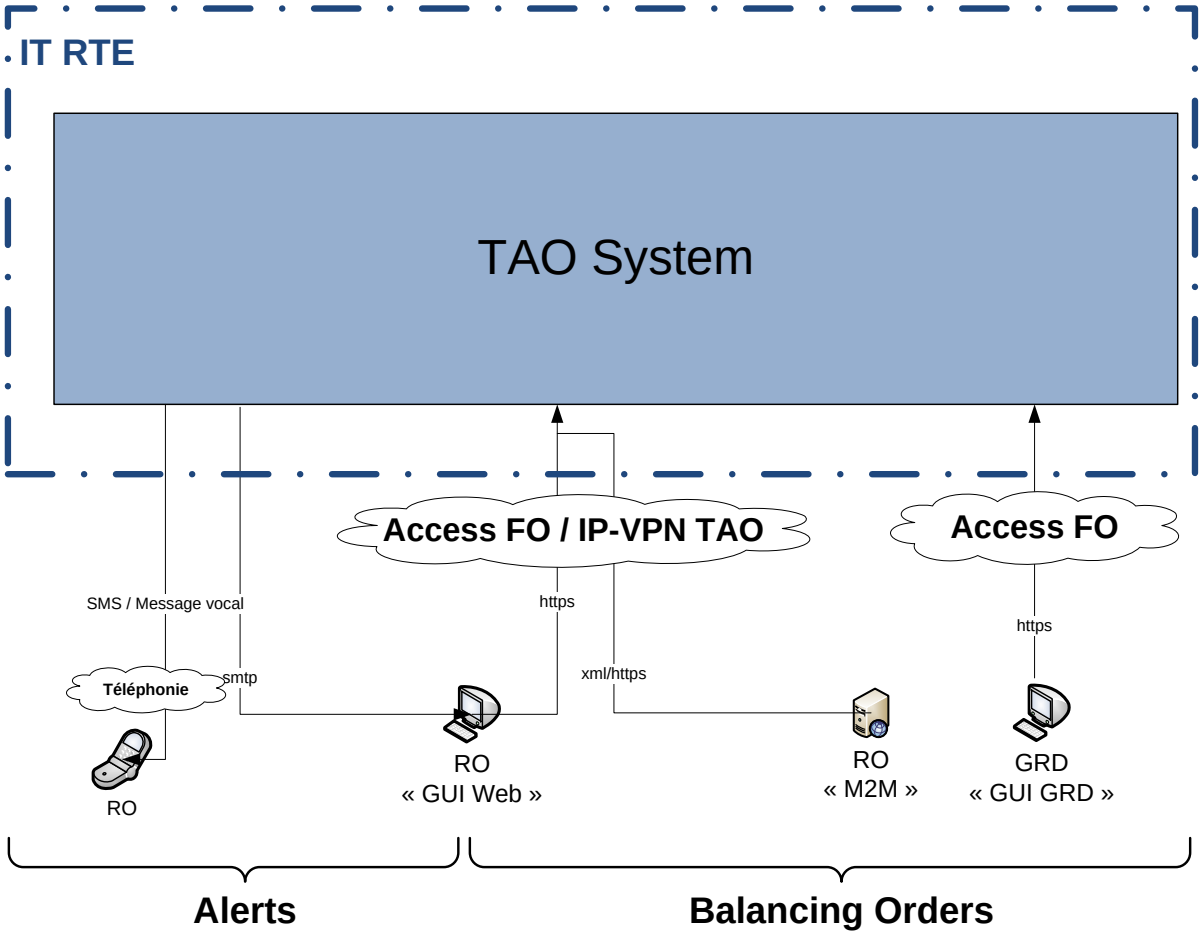
[3] This date and time corresponds to the time T_0 in §3.. Only one e-mail / SMS / Voice message will be provided in the event of availability of several orders at the same time.
[4] If message delivery fails (no line unhooked, invalid phone number, network error), up to 2 further attempts are made. Each new attempt is made 15 seconds after the previous one.
[5] We draw your attention to the fact that where a landline number is given, the SMS will be translated by the telecom operators into a voice message, leading to a dubbed telephone call.

The e-mail addresses and telephone numbers mentioned above should be provided in the request for access to the TAO system. For this request or for any modification of these contact details[6], the RO should make a request to its Customer Relations Representative.

These alerts are provided for information purposes only. They therefore do not have any contractual value and are not actionable. Only the information transmitted by the solutions described in article article

TAO system architecture

The diagram below presents the overall architecture of the TAO system.



Interfacing solutions prevails.

[6] The request for modification to contact details should be made by the OR with 3 months' notice, for implementation by RTE.

3. Balancing order transmission process to ROs and receipt of the Final Dispatch Schedule

RTE operational constraints imposes requirements in terms of dynamic of the response to balance the electricity system. RTE distinguishes two main categories for the exchange dynamic necessary between RTE and the RO to respond to a balancing requirement: the long dynamic, the short dynamic and the "standard orders" dynamic.

Depending on the origin of the need for balancing, two types of orders may be sent by RTE:

- "Standard Orders": orders from a standard RR offer sharing platform in which the balancing service provider participates.
- "Specific orders": orders issued by RTE under the balancing mechanism. **Specific orders can be long-dynamic or short-dynamic.**

Standard and specific orders correspond to the activation by RTE of offers, standard or specific, for EDAs

3.4. Long dynamic

Definition of long dynamic

The long dynamic is characterized by the activation of offers with a DMO strictly greater than 30 minutes. It allows a response to situations identified prior to their occurrence.

In view of the lowest constraint related to the due date for completion (time constraint lessened in view of the due dates for completion and the possibility for RTE operators to find more alternative solutions), the process of sending a response agreeing or refusing to implement the balancing order is less restricted than the one necessary when the orders are transmitted for reasons and constraints related to the "short dynamic" described in article 3.2 Short dynamic.

Implementation of the long dynamic in the TAO system

The implementation of the transmission of orders in the TAO system for offers with a DMO of more than 30 minutes takes the form of the following process (the parameter X mentioned below corresponds to a defined period in the TAO system):

Step 1: Availability of the order

The balancing order is made available to the RO in the TAO system. This time when it is made available is known as T_0.

This time T_0 will comply with the DMO (or DP+Gradient) indicated in the CUO of the offer requested, i.e.:

$$T_0 + \text{DMO} \leq \text{Activation Time of the balancing Order}$$

Step 2: Consultation of the balancing order

The RO interrogates the TAO system to consult the balancing order made available. This consultation can be carried out either by the "Web GUI" interface or the "M2M" interface, depending on the recommendations given in article 4 and 5.

The consultation of the order should be carried out between time T_0 and $T_0 + X$.

The time of the first consultation of the order is known as T_1.

After the time $T_0 + X$, if no consultation has been made by the RO, the TAO system notifies the RO of a "lack of response for the order Id n°aa" according to the methods described in article 4 and 5. In this situation, it is no longer possible for the RO to interact with the order as it has now expired.

The parameter X has a value of 300s. A review of this parameter is possible at the initiative of RTE: it is Notified with three months' notice to the Balancing Service Providers.

The dynamic (short or long) applied to the balancing order, and the times T_0 and T_1 are information contained in the balancing order (see article 5).

The order is left available for consultation on the TAO system until time $T_0 + X$.

Step 3: Sending of the response stating acceptance or refusal of implementation

This step can only be carried out if step 2 has been validated, in other words, if the order was consulted before time $T_0 + X$.

The RO sends its response stating acceptance or refusal of the balancing order. This sending can be carried out either by the "Web GUI" interface or the "M2M" interface, depending on the recommendations given in article 4 and 5.

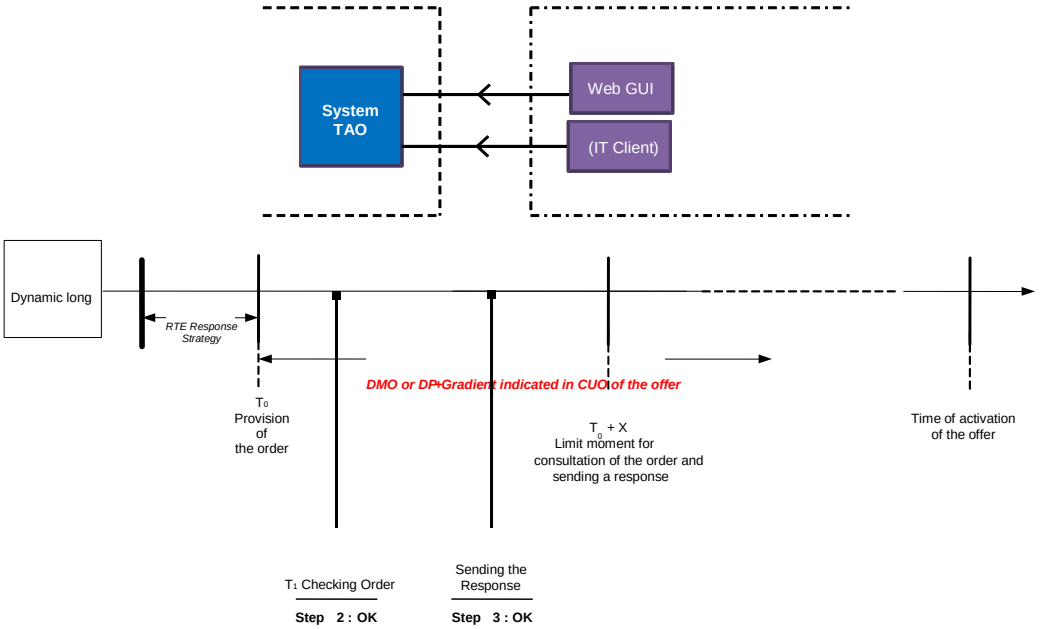
The response should be received between times T_0 and $T_0 + X$. If the response is sent between these two times, the TAO system provides a technical acknowledgement on receipt of the response.

For EDAs configured to transmit Final Dispatch schedules, a bundled submission of responses (in a single xml file) is expected for orders sent in the same file on the same EDA

A 2nd response to an order remains without effect, the TAO system notifies the RO that a "response has already been received and taken into account for the order Id n°aa" according to the methods described in article 4 and 5.

After the time $T_0 + X$, if no response has been received by the TAO system, the TAO system notifies the RO of a "lack of response for the order Id n°aa" according to the methods described in article 4 and 5.

The diagram below shows a description of the long dynamic process.



Step 4: Sending the Final Dispatch Schedule[7]

This step is only valid for EDAs configured to transmit Final Dispatch schedules.

This step can only be performed via the M2M interface, the Final Dispatch Schedule cannot be sent via the Web HMI interface.

This step can only be completed when an order has been accepted. The moment of acceptance of the order is noted T_a.

The RO sends the Final Dispatch Schedules that will be or will be completed to respond to this order.
The following principles apply:

- A Final Dispatch Schedule is expected for each EDP (Scheduling Entity) of the EDA concerned in the order in the standard case. For a specific case, the Final Dispatch Schedule is only expected when declared in GIPSE.
- A bundled Final Dispatch Schedule submission (in a single xml file) is expected for PMs that refer to orders sent in the same xml file on the same EDA. One xml file is expected per EDA. A file will not be able to group PMs for multiple EDAs.
- If an EDP is affected by multiple orders transmitted simultaneously (contained in the same xml file), the RO must transmit a single Final Dispatch Schedule for that EDP. In this case the Final Dispatch Schedule is the Final Dispatch Schedule resulting from the acceptance of all orders.

[7] In accordance with MARE V9, paragraph 3.1.4.2, from a date M' which will be notified to all Balancing Service Providers with one (1) Month's notice, for the Specific Offers

- In all cases, each Final Dispatch Schedule contains the ID(s) of the order(s) to which it refers. A single xml file cannot contain both PMs that refer to standard orders and PMs that refer to specific orders.

The Final Dispatch Schedule is expected to be:

- In relative values[8] for entities which are the subject of explicit specific offers
- In absolute values for entities subject to implicit specific offers

In the event that there is no EDP attached to the EDA concerned by the order, and only in this case, the Final Dispatch Schedule is expected to be meshed with the EDA (in relative values).

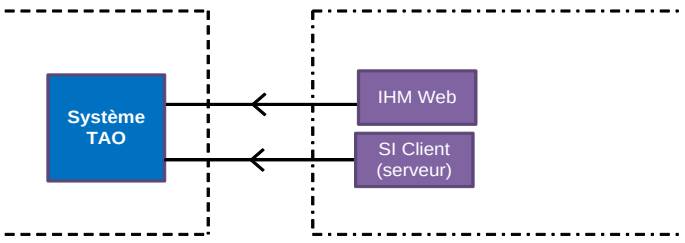
The PM(s) shall be received by RTE between T_a and T_a + X'. The default value for this parameter is 120 seconds. A review of this parameter is possible at the initiative of RTE: three months' notice will be given to Balancing Service Providers.

Only one version of each Final Dispatch Schedule is allowed.

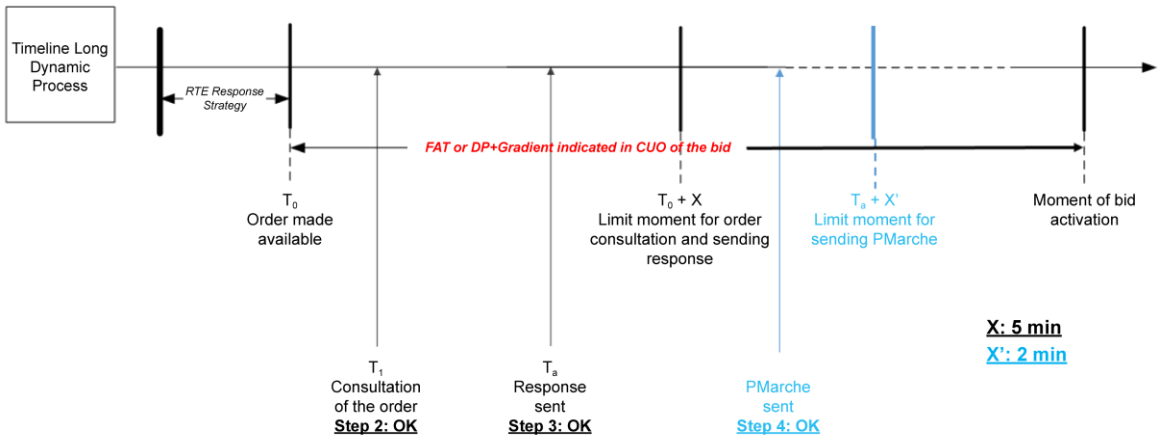
Beyond the $T_a + X$ moment, if no exploitable Final Dispatch Schedule has been received by the TAO application, the TAO application shall notify the RO in accordance with the procedure to be described later in §4 and 5.

All possible warning messages are detailed in §5.6

The diagram below illustrates the process description of the long dynamic.



[8] Relative to a case without balancing.



3.5. Short dynamic

Definition of short dynamic

The short dynamic is characterized by the activation of offers in which the DMO is lower than or equal to 30 minutes.

In order to guarantee an effective response to imbalances and in view of the reaction times, it is necessary for RTE to be informed rapidly about the balancing order being taken into account by the RO. In these situations, RTE expects from order recipients associated with the BE whose offers have a DMO lower than or equal to 30 minutes:

- the implementation of an industrialized sequence for processing the balancing order, thus guaranteeing reactivity;
- the implementation of a process for sending a response agreeing or refusing to implement the balancing order, allowing RTE to quickly know the acceptance and effective availability of these resources after the activation is requested (they may in turn be subject to unexpected events occurring in real time: technical constraint, lower consumption, environmental or safety constraint), to allow RTE to draft another strategy if necessary.

Implementation of the short dynamic in the TAO system

The implementation of transmission of the orders within the TAO system for offers in which the DMO is lower than or equal to 30 minutes takes the form of the following process:

Step 1: Availability of the order

During this first step, the balancing order is made available to the RO in the TAO system. This time when it is made available is known as T_0.

Step 2: Consultation of the balancing order

During this second step, the RO interrogates the TAO system to consult the balancing order made available. This consultation can only take place in nominal mode through the "M2M" interface, according to the recommendations provided in article 5. Consultation of short dynamic balancing orders can only be carried out through the "Web GUI" interface (according to the recommendations provided in article 4) in the event of implementation of downgraded modes as defined in reference document [3].

The consultation of the order should be carried out between time T_0 and $T_0 + X_2$.

The time of the first consultation of the order is known as T_1.

This time T_1 will comply with the DMO (or DP+Gradient) indicated in the CUO of the offer requested, i.e. (the parameters X_2 and Y mentioned below correspond to periods defined in the TAO system):

$$T_1 + \text{DMO} \leq \text{Activation Time of the balancing order}$$

After the time $T_0 + X_2$., if no consultation has been made by the RO, the TAO system notifies the RO of a "lack of response for the order Id n°aa" according to the methods described in article 4 and 5. In this situation, it is no longer possible for the RO to interact with the order as it has now expired.

The parameter X_2 has a value of 60s. A review of this parameter is possible at the initiative of RTE: it is notified with three months' notice to the Balancing Service Provider.

The dynamic (short or long) applied to the balancing order, and the times T_0 and T_1 are information contained in the specific balancing order (see article 5).

If the order is consulted before time $T_0 + X_2$, then the order is left available for consultation in the TAO system until the time $T_0 + X_2$.

Step 3: Sending of the response stating acceptance or refusal of implementation

This third step can only be carried out if step 2 has been validated, in other words, if the order was consulted before time $T_0 + X_2$.

During this third step, the RO sends its response stating acceptance or refusal of the balancing order. This sending can only take place in nominal mode through the "M2M" interface, according to the recommendations provided in article 5. Sending of short dynamic balancing orders can only be carried out through the "Web GUI" interface (according to the recommendations provided in article 4) in the event of implementation of downgraded modes as defined in reference document [3].

The response should be received between times T_1 and $T_1 + Y$. If the response is sent between these two times, the TAO system provides a technical acknowledgement on receipt of the response.

For EDAs configured to transmit Final Dispatch schedules, a bundled submission of responses (in a single xml file) is expected for orders sent in the same file on the same EDA.

After integration of a response, for any sending back, the TAO system notifies the RO that a "response has already been integrated for order Id n°aa" according to the methods described in article 4 and 5. In this situation, it is no longer possible for the RO to interact with the order as it has now expired.

After the time $T_1 + Y$, if no response has been received by the TAO system, the TAO system notifies the RO of a "lack of response for order Id n°aa" according to the methods described in article 4 and 5.

The parameter Y has a value of 120s. A review of this parameter is possible at the initiative of RTE: it is Notified with three months' notice to the Balancing Service Provider.

Step 4: Sending the Final Dispatch Schedule[9]

This step is only valid for EDAs configured to transmit Final Dispatch schedules.

This step can only be performed via the M2M interface, the Final Dispatch Schedule cannot be sent via the Web HMI interface.
This step can only be completed if the order has been accepted. The moment of acceptance of the order is noted as T_2.

The RO sends the PM(s) that will be or will be completed to respond to this order. The following principles apply:

- A Final Dispatch Schedule is expected for each EDP (Scheduling Entity) of the EDA concerned in the order in the standard case. For a specific case, the Final Dispatch Schedule is only expected when declared in GIPSE.
- A bundled Final Dispatch Schedule submission (in a single xml file) is expected for PMs that refer to orders sent in the same file. One xml file is expected per EDA. A file will not be able to group PMs for multiple EDAs. If an EDP is affected by multiple orders transmitted simultaneously (contained in the same xml file), the RO must transmit a single Final Dispatch Schedule for that EDP. In this case the Final Dispatch Schedule is the Final Dispatch Schedule resulting from the acceptance of all orders.
- In all cases, each Final Dispatch Schedule contains the ID(s) of the accepted order(s) to which it refers. A single xml file cannot contain both PMs that refer to standard orders and PMs that refer to specific orders.

The Final Dispatch Schedule is expected to be:

  - In relative values[10] for entities which are the subject of explicit specific offers
  - In absolute values for entities subject to implicit specific offers

[9] In accordance with MARE V9, paragraph 3.1.4.2, from a date M' which will be notified to all Balancing Service Providers with one (1) Month's notice, for the Specific Offers
[10] Relative to a case without balancing.

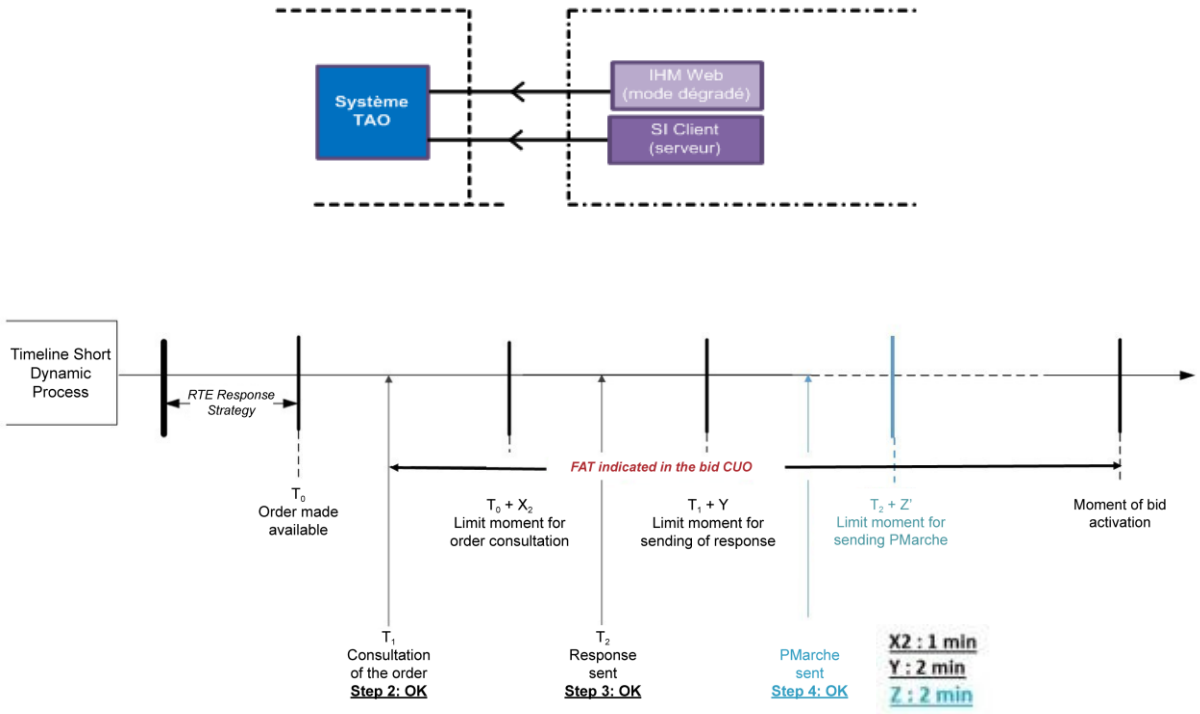
In the event that there is no EDP attached to the EDA concerned by the order, and only in this case, the Final Dispatch Schedule is expected to be meshed with the EDA (in relative values).

The Final Dispatch Schedule(s) shall be received by RTE between T_2 and T_2 + Z. The Z parameter has a value of 120s. A review of this parameter is possible at the initiative of RTE: three months' notice will be given to Balancing Service Providers.
Only one version of each Final Dispatch Schedule is allowed.

Beyond the T_2+ Z moment, if no exploitable Final Dispatch Schedule has been received by the TAO application, the TAO application shall notify the RO in accordance with the procedures to be described in article 4 and 5.

All possible warning messages are detailed in §5.6

The diagram below shows a description of the short dynamic process.



3.6. The "standard offers" dynamic :

The "standard offers" dynamic is similar to the short dynamic, with the only difference that the value of X2 is 30 seconds.

A review of this parameter is possible at the initiative of RTE: three months' notice will be given to Balancing Service Providers.

The behavior is identical to the short dynamic one : the order remains available for consultation until $T_0 + X_2$, it is withdrawn from M2M consultation upon receipt of a response sent by the RO (acceptance or refusal).

The date of sending the Final Dispatch schedule is applicable from a date M, which will be notified by RTE to all Balancing Service Providers with one (1) Month's notice (see MARE Regulation V9 Chapter 3.1.4.2)
The Final Dispatch Schedule is expected in absolute values for entities that are subject to standard offers. Powers will have to be whole numbers only.

3.7. Final Dispatch Schedule Transmission Process

Scheduling Convention

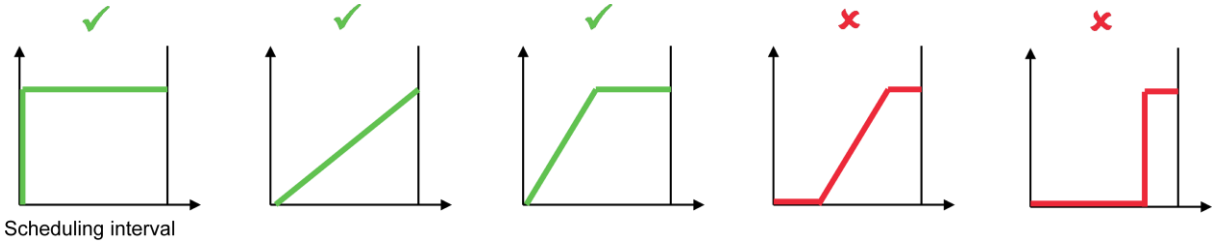
Running schedules are sent in the interval [H-30; H+1h05], at 5 minute intervals.

The selected convention is the "finishing convention", which means that:

- the beginning of the change is positioned at the beginning of the scheduling interval;
- power reached is indicated at the earliest during the scheduling interval and at the latest at the end of the scheduling interval

For example, the power given on the interval 10:00 is for the interval]9:55, 10:00].

The schemas show the correct and non-correct configurations:



Checks carried out at the acceptance of Final Dispatch Schedules

Checks are carried out upon receipt of the Final Dispatch Schedules which may lead either to a rejection of the file (technical controls) or a warning (business controls). In the event of rejection of the file, or a Final Dispatch Schedule sent out of time, RTE considers that the order has been accepted and will be executed in accordance with the process for a standard product.

List of deviations leading to a rejection of the Final Dispatch Schedule file sent by the service provider:

- file syntax not complied with;
- failure to comply with the number of points in relation to the time interval;
- expected chronicle absent (active power, automatic frequency restoration reserve, frequency containment reserve);

- offer number not complied with.

In the case of a multi-EDP EDA, the Final Dispatch Schedule must be sent per EDP. If one of the Final Dispatch Schedule files is disabled, all Final Dispatch Schedules of the EDAs will be rejected.

In the case of multiple offers on the same EDA, the Final Dispatch Schedule file sent must contain only the activated offer numbers (offers where the order has been accepted).

In the event of rejection of the Final Dispatch Schedule service provider, the removal of another Final Dispatch Schedule is not possible.

List of business controls:

- If PMs are sent with decimal values, they will be truncated to their full value. Decimal values are written with a decimal point: writing with a comma will lead to a syntax error (and thus a rejection of the file).
- If the Final Dispatch Schedule contains points outside the expected time window, the points will be ignored (the Final Dispatch Schedule is truncated on the [H-30] window; H+1h05]).
- If the Final Dispatch Schedule is described over a time window smaller than the expected window, RTE will consider the Final Dispatch Schedule to be the PA on undescribed periods.
- If the declared powers (RPh, RPb, RSh, RSb) on all EDP belonging to a EDR (Reserve providing entity) exceed the maximum declared values for this EDR, then they will not be registered.

These controls lead to a warning if necessary.

4. Implementation with Web GUI Interface

4.1. Connection to the RTE IT system

In order to be able to use the Web GUI Interface of the TAO system, an RO has to make a request to its CRC (Account manager).

At the end of this request, an electronic key for connection to the RTE IT (PKI certificate, in the form of a PKCS#12 file, i.e. the extension of which is ".p12"), dedicated for access to the TAO system, is supplied to the RO. This key should be installed by the RO according to the methods described in reference document [2].

4.2. Description of the exchange interface

Connecting the Web GUI exchange interface

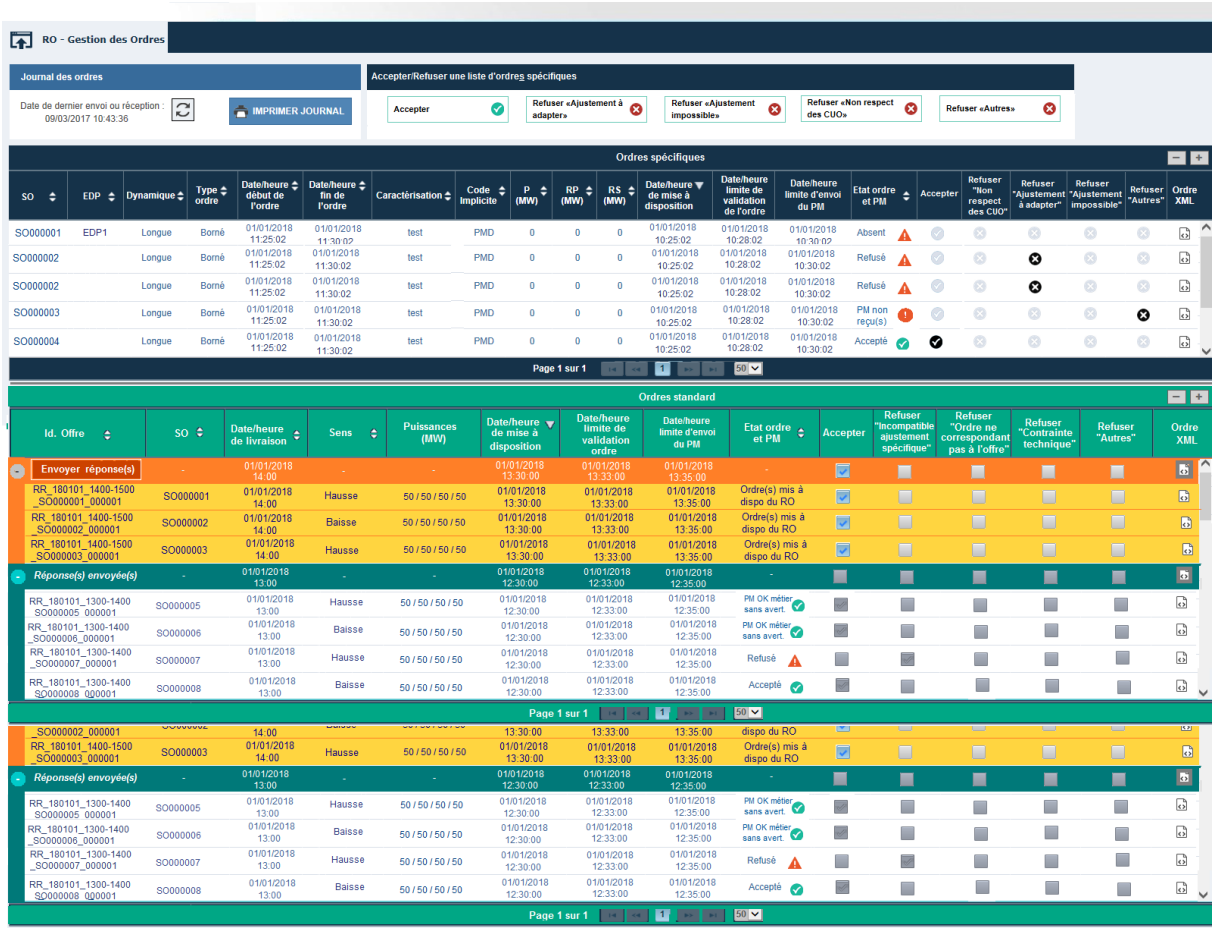
The Web GUI Interface of the system can be accessed with a web browser, using an electronic key for connection to the RTE IT (see article Implementation with Web GUI Interface

Connection to the RTE), at the following url[11]:

Solution for access to the RTE IT (see article 2)	Type of access	Connection URL
RTE FO	Internet	https://portail.iservices.rte-france.com/tao/
IP-VPN TAO	-	https://tao.ipvpn.services.rte-france.com/tao/
TAO test platform[12]	Internet	https://portail-dev.iservices.rte-france.com/tao/ https://portail-metier.services.rte-france.com/tao/
TAO test platforme via IP VPN	IP VPN	https://tao-preprod.ipvpn.services.rte-france.com/tao/

[11] The url varies depending on the type of access to the RTE IS chosen by the RO. These URLs are given for information purposes and may be modified by RTE.

[12] This platform is available to customers who wish to test TAO system. A PKI certificate dedicated to this platform is to ask to his relationship account manager.



The Web GUI of the TAO system is "thin client" type. More specifically, the web pages can be displayed with Microsoft Internet Edge Chromium without any additional plug-in. RTE only guarantees operation with this browser.

Operation of the Web GUI Interface

The Web GUI Interface is presented to the RO in the following format in the web browser[13]:

This interface offers the RO the following features (detailed in the paragraphs below):

- See the log of specific orders (list of orders presented in the interface and their main data),
- View the standard order log (list of orders presented in the interface and their main data)
- Update the specific and standard order log

[13] The data presented in the image does not correspond to any real relevant case. The interface dedicated to standard orders will be activated when activating the standard RR trading platform.

- Send responses to accept or refuse implementation of specific balancing orders in case of failure to send replies via M2M
- Send responses to accept or refuse implementation of standard balancing orders in case of inability to send replies via M2M
- Download specific orders in XML format,
- Print the specific and standard order log.
- Download groupings of standard orders in XML format,
- Enlarge / Shrink tables for specific and standard orders

Consult the specific order log

The interface allows the RO to consult the list of balancing spécific orders concerning it, in which the dates of availability (see article 3) in the TAO system are later than the current date less 2 days.

This log also presents the main data associated with each of the specific orders, i.e.:

- Be associated with the balancing order
- Dynamic associated with the balancing order (see article 3)
- Order type (JNA or limited)
- Date and time when the order starts
- Date and time when the order ends
- Characterization associated with the order

When the value of characterisation field is "test", the order is not to implement and may have inconsistent data according to the offer of adjustment requested. The objective of a such order is to check the connection between RO and RTE.

- The implicit code
- Power/FCR/aFRR triplet associated with the order[14]
- Final date and time for validation of the order
- The Final Dispatch Schedule date/time deadline
- Status of order and Final Dispatch Schedule: possible values are:

Label	**Symbol**
In hand	No symbol
Absent	⚠

[14] In the case of an order with the characterization "return program", the values for P / RP / RS sent by TAO will be 9999/9999/999.

Refused	
Accepted	
PM(s) not expected	
Final Dispatch Schedule expected	No symbol
Final Dispatch Schedule not received	
Final Dispatch Schedule technical NOK	
Final Dispatch Schedule technical OK	
Final Dispatch Schedule OK function with warning.	
Final Dispatch Schedule OK function without warning.	
Final Dispatch Schedule NOK function	

The log allows the RO to sort the list of orders according to each of the above data, except for date/time deadlines.

See standard order log (list of orders presented in the interface and their main associated data),

The interface allows the RO to view the list of standard balancing orders for the RO, where the availability dates (see § 3) on the TAO application are greater than the current date minus 2 days.

This log presents the main data associated with each of the standard orders:

- Offer ID
- EDA
- Date and time of delivery
- The Direction (Up or Down)
- The 4 Power values (MW)
- The Date and time the order was made available
- The Offer validation date/time deadline
- The Final Dispatch Schedule date/time deadline
- The Status of the offer and Final Dispatch Schedule: possible values will be:

Label	**Symbol**

RO offer(s) made available	No symbol
Absent	⚠
Viewed	✓
Refused	⚠
Accepted	✓
Technical NOK response	⚠
PM(s) not expected	✓
Final Dispatch Schedule expected	No symbol
Final Dispatch Schedule not received	!
Final Dispatch Schedule technical NOK	!
Final Dispatch Schedule technical OK	✓
Final Dispatch Schedule OK function with warning.	~
Final Dispatch Schedule OK function without warning.	✓
Final Dispatch Schedule NOK function	!

This data is displayed by grouping: a grouping will correspond to a grouping of standard orders (1 per hour).

Update specific and standard order log

A button in the HMI Web interface allows the RO to update both the specific order log and the standard order log at the same time.

Clicking on this button thus creates a consultation of the orders available on the TAO application (see Step 2, §3) and updating the list of orders and key data associated with them.

The order log update button is as follows: 

Send responses to accept or refuse to implement specific balancing orders in case of failure to send replies via M2M:

The interface makes it possible to send responses stating acceptance or refusal to implement balancing orders: To do this, the RO has available on the line associated with the order, one icon ✓ and four icons ⊗, distributed in five columns.

Clicking on the icon ✓ sends a response agreeing to implement the order.

Clicking on one of the icons ⊗ sends a response refusing to implement the order. For specifics orders, four types of refusal response are available and defined in the column headers:

- "Non respect des CUO" ⇔ non-compliance with CUO
- "Ajustement à adapter" ⇔ partial balancing ordrer only can be carried out
- "Ajustement impossible" ⇔ balancing order impossible to carry out
- "Autres"[15] ⇔ others reasons

Once the response has been sent, the icon of the response sent becomes black and the other icons become grey. All of the icons become inactive.

The columns for sending a response are located to the right in the specific order table.

Several responses can also be sent at the same time by the RO. To do this, several orders should be selected (click on the required order lines by holding down the Ctrl key on the keyboard) by the RO, then the response required for these orders (identical for all orders selected) can be sent by clicking on one of the buttons located in the framed zone at the top: "Accept/Refuse a list of specific offers". marked in blue on the model above. These buttons cover all five potential response types (one acceptance / four refusals).
Attention: The central box "Accept/Refuse a list of specific orders" allows only specific orders to be responded to.

Send responses to accept or refuse implementation of standard balancing orders in case of inability to send replies via M2M

The interface allows you to send a response to accept or reject the installation of standard balancing orders. The operation is different from the table of specific orders. For standard orders:

1. For each standard order, select the response(s) by clicking the check marks in the table. It is possible to directly select identical responses for all orders in a group by clicking on a response check mark on the grouping line.
2. When a response has been selected for each standard order, send the response for all orders in the grouping by clicking on the "Submit response(s)" button for the grouping line.

   All responses from the same group must be sent at the same time.

For standard orders, four types of refusal response are available and defined in column headings:

[15] Please note: for any type of denial response sent through a M2M interface, the reason "Autres" is checked in the Web GUI.

- Specific incompatible balancing operation
- Order not corresponding to the offer
- Technical constraint
- Other[16]

The columns for sending a response are located to the right in the standard order table.

It is possible to reduce the grouping once the responses are sent with the "-" symbol on the left of each grouping line.

Download specific orders in XML format

On each row associated with a specific order the  icon is shown in the last column. Click on this icon to download the order in XML format, presented in article 5.[17]

The column with this icon is the last column to the right of the specific orders table.

Print specific and standard order log

A "PRINT LOG" button is available in the Web HMI interface. Clicking this button allows the RO to print the specific order log and standard order log in .csv format. Both files will be downloaded to a .zip folder

The order log print button is located in the zone on the left above the specific order table.

Download groupings of standard orders in XML format,

On each row associated with a standard order group, the  icon is shown in the last column. Clicking on this icon allows you to download all the orders for the group, presented in §5/, into the same xml file.

The column with this icon is the last column to the right of the standard order table.

Enlarge / Shrink tables for specific and standard orders

[17] Attention: The Xml format of orders that can be downloaded via the Web HMI interface complies with the syntax in `Tao-Order.xsd` (and not the syntax in `Tao-Orders.xsd` for orders consulted in M2M) described in article 5.

Two buttons  at the top right of each table (specific orders / standard orders) allow you to enlarge and shrink the tables on the following values: min - 25% - 50% - 75% - max

Submission by RTE of a test order

In the case of first use of TAO or the need for a connection test, RTE can send test orders to the RO. These test orders should not result in actual balancing operations and are only used to test the order and response of the RO.

The characteristics of specific test orders on the one hand and standard test orders on the other are described in paragraph §5 below.

5. Implementation with M2M Interface

5.1. Operating principles of the M2M interface

The M2M interface of the TAO system is made up of two features, in accordance with the process described in article 3:

- Consultation by RO of specific and standard balancing order(s)
- RO sends response(s) accepting or refusing implementation of specific and standard orders.
- RO sends specific and standard Final Dispatch Schedules

In the context of the M2M interface, consultation of the balancing orders by the RO is based on a system of automatic, regular interrogation of the TAO system by the RO IS, according to the methods described in the following paragraphs. To do this, the RO sets up an IS system allowing it to perform these automatic, regular interrogations. The time interval between each interrogation "I" is set by RTE and respected by the RO.

The period between each interrogation of an RO should be able to be set as one of the following values: 5, 10, 15, 20, 25 and 30 seconds (+/- 3 seconds).

The possible values since 1 February 2017 are 20, 25 or 30 seconds, at the RO's choice for the consultation of specific orders (+/- 3 seconds).

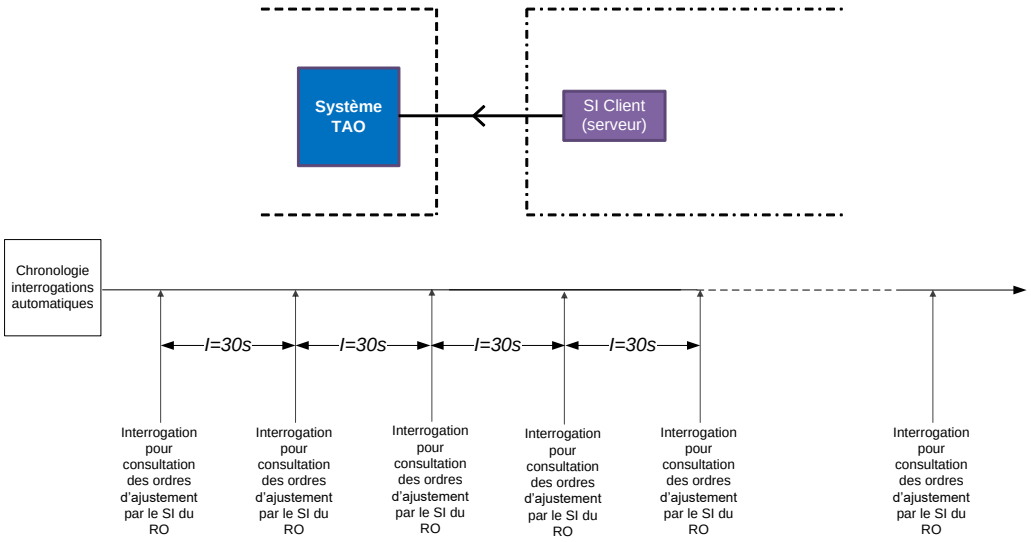
The value is 10 seconds for the consultation of standard orders (+/- 3 seconds).

The consultation of standard orders must be carried out within a time range that must remain configurable. From 1 March 2019 the hourly range is as follows: H+20 - H+35. No request should be made outside this time range.

A review of these parameters is possible at RTE's initiative: three months' notice will be given to Balancing Service Providers.

Under the M2M interface, the RO sends acceptance or refusal of installation responses and the submission by the RO of PMs is based on an IS system to be implemented by the RO as described in the following paragraphs (and following the process described in §3).

The diagram below illustrates the automatic, regular interrogation system for consultation of orders in the context of the M2M interface (with an example value of 30s for the period between each interrogation):



5.2. Connection to the RTE IT

Connection principle

In order to be able to use the M2M Interface of the TAO system, an RO has to make a request to its account manager.

At the end of this request, an electronic key for connection to the RTE IT (PKI certificate, in the form of a PKCS#12 file, i.e. the extension of which is ".p12"), dedicated to the TAO system, is supplied to the RO.

To access the RTE IT the RO should then use client software that allows an encrypted connection to be established (HTTPS protocol) with a server, and that allows authentication between the client and the server. To do this, the software must meet the following conditions:

- Activate and manage SSLv3 or TLS protocol
- Be able to authenticate itself with the RTE server using the certificate provided by RTE.

Example cURL

The example below is given for information purposes. The scripts, software packages or ad hoc developments created for data exchange should be implemented by the User. RTE does not provide any support for the implementation of this example or for any other development solution rolled out by the User to communicate with the TAO system.

cURL (Client URL Request Library) is an online command interface that allows access to resources located by URL — see http://curl.haxx.se.

The line of code of the cURL command below sends a file to a target server designated by a URL:

curl.exe --cacert IntCA.cer --cert userCert.pem --form upload=@test001.txt https://domain.com/myserver/upload/appli/Appli1

- "IntCA.cer" is the file that contains the certificate from the root Certification Authority that issued the certificate from the target server. It allows the target sever to be authenticated.
- "test001.txt" is the file to be sent.
- "https://domain.com/myserver/upload/appli/Appli1" is the URL of the target server.
- "userCert.pem" is the file that contains the client certificate (the private key) that allows the sender to be authenticated with the target server.
- Notes:

- In this example the cURL program and the files referenced are all placed in the current directory from where the command is launched.
- The "openssl" software (http://www.openssl.org) can transform files containing certificates into files in ".cer" or ".pem" format.

5.3. Technical principles of the M2M interface

Global rules for sequencing of exchanges

The exchanges implemented in the context of the M2M interface are based on the use cases, the features and methods of use of which are described in the paragraphs below.

The use of a service takes place in 3 stages:

1. calling the service (request)
2. processing of the request by the TAO system
3. response from the TAO system with the data to be transmitted and a status describing the performance of the service processing (Ok, Nok).

Technical principles of exchanges

The exchanges described in the rest of this paragraph are REST type services.

REST is a type of architecture based on HTTP protocol:

- access to a resource (by its unique URL) to carry out various operations (GET read / POST write / PUT modification / DELETE remove), operations natively supported by HTTP.
- in the context of the TAO system, use of GET (to retrieve information) and POST (to modify/send information) methods only.
- formatting of data exchanged in XML.[18]

For technical acknowledgements of standard balancing order response files and Final Dispatch Schedule files,

If the file is unreadable, it will be returned a http code 400 or 500 depending on the type of error:

- Badly formatted message, wrong xml file structure: code 400
- Other technical error: code 500

If the file is readable, an acknowledgement in ENTSOE format will be returned as set out in the following sections (§5.5.2 and §5.6).

[18] Please note: to avoid character coding problems, the list of characters used in the exchanges described in the following paragraphs has been limited (mainly by deletion of special characters).

For specific orders, the exchange contract for each of the services will be made up of a WADL containing the following technical information:

Title	Marker	Description	Example
URL	`<resource path>`	Context URL. This is the URL through which the service can be contacted. It is a URL related to the TAO basic URL and contains the name of the service.	`<resource path="/ro/ordres">` For example, if the basic URL of the TAO system is *https://rte-france.com/tao* and the context URL is */ro/ordres,* then the complete URL for accessing the service is *https://rte-france.com/tao/ro/ordres/.*
Methods	`<method name>`	https method used • *POST* to modify/send information • *GET* to retrieve information	`<method name="POST">`
Question	`<request>`	Description of request	
	`<representation mediaType>`	Format used for request (XML for TAO)	`<representation mediaType="application/xml"/>`
Replying	`<response>`	Description of response	
	`<representation mediaType>`	Format used for response (XML for TAO)	`<representation mediaType="application/xml"/>`

Data exchanged	`<xs:grammars>`	Contains the reference to the xsd file or files describing the grammar of the data that will be exchanged in the form of XML files.	`<grammars>`
			`<include href="xsd/Tao-Orders.xsd"/>`
			`<include href="xsd/Tao-Reception-Ack.xsd"/>`[19]
			`<include href="xsd/Tao-Reponse-Orders.xsd"/>`
			`<include href="xsd/Tao-Reponse-Orders-Ack.xsd"/>`
			`</grammars>`

For standard orders as well as Final Dispatch Schedule, the swagger documentation is available as an attachment.

[19] A single wadl file `taoOrderService.wadl` is implemented in TAO, bringing together all web services between TAO and the upstream or downstream applications. The file `Tao-Reception-Ack.xsd` is not used in exchanges between TAO and the RO. However, this file is necessary for exchanges with other applications upstream, which explains why it is included in the delivery package.

The basic URLs of the TAO system described in the above table are, depending on the type of access :

Solution for access to the RTE IT (see 2)	Type of access	Connection URL
RTE FO access	Internet	https://portail.iservices.rte-france.com/tao/
IP-VPN TAO	-	https://tao.ipvpn.services.rte-france.com/tao/
TAO test platform[20]	Internet	https://portail-dev.iservices.rte-france.com/tao/ https://portail-metier.services.rte-france.com/tao/
TAO test platform via IP VPN	IP VPN	https://tao-preprod.ipvpn.services.rte-france.com/tao/

[20] This platform is available to customers who wish to test TAO system. A PKI certificate dedicated to this platform is to ask to his relationship account manager.

5.4. Balancing order consultation flow

5.4.1 Consultation flow for specific balancing orders

Functional description

During its process of automatic consultation of orders, the M2M RO consults the TAO system to retrieve the list of the most recent specific balancing orders issued. This flow describes this stage of retrieval of the balancing specific orders. This service contacts the RO calling up all specific orders concerning it for which the TAO system is waiting for a response from the RO.

Main technical data

The table below details the technical data of the flow described in the wadl file `taoOrderService.wadl` appended to this document.

Title	Field	Value	Description
URL	`<resource path>`	`/rest/ordre/retrieveOrders`	Context URL. This is the URL through which the service can be contacted. It is a URL related to the TAO basic URL and contains the name of the service.
Méthode	`<method name>`	`GET`	https method used • *POST* to modify/send information • *GET* to retrieve information
Question	`<request>`		Contains the XML description of the flow exchanged, as for XSD grammar. See article "Input data"
	`<xs:grammars>`		
Réponse	`<response>`	`"Ordres"`	Contains the XML description of the flow exchanged, as for XSD grammar. See article "Input data".
	`<xs:grammars>`	`Tao-Orders.xsd`[21] `Tao-Order.xsd`	

Input data

During the consultation, the RO does not forward any data. It performs a simple GET.

Output data

This section describes the list of specific orders produced by the TAO system in return in the "response" part of the specific order consultation service.
This description is given according to three levels of information:

1. Presentation of the list of data retrieved for each of the specific balancing orders consulted
2. Presentation of the XSD file of exchanges

[21] Le fichier `Tao-Orders.xsd` (association de 1 ou plusieurs ordres unitaires) utilise le fichier `Tao-Order.xsd` (description d'un ordre unitaire). La balise xsd `<xs:import>` permet de réaliser cette inclusion.

3. Illustration with examples from XML files.

Data exchanged

The table below details the data retrieved for each of the orders to be activated.

Field	Mand.	Format	Rules
Order Info			
Id de l'ordre ⇔Order Id	Yes	Alphanumerical 16 characters	constructed as follows: `<Lettre_Alphanumérique><SéquenceNumérique>` where `<Lettre_Alphanumérique>`: alphabetical character with 1 character. `<SéquenceNumérique>`: numerical sequence of 15 characters on the right and completed with 0s on the left. Examples: E000000000002736 T000000001023509
Debut Immediat ⇔ Immediate start	Yes	Boolean (true/false)	N/A
Jusqu'a Nouvel Avis ⇔ Until Further Notice (JNA)	Yes	Boolean (true/false)	N/A
BE Info			
Nom EdA ⇔ BE Name	Yes	Alphanumerical	N/A
Nom EdP ⇔ PE Name	No(*)	Alphanumerical	(*) Mandatory for orders whose cause is "RSO". Notified in every case.
Telereglage ⇔ Teleregulation	Yes	Boolean (true/false)	Can be "true" for an implicit order sent to a Hydroelectric BE.
Offer Info			
Id de l'offre correspondant à l'ordre cree ⇔ Id of the offer corresponding to the order created[22]	Yes	Numerical	For an order with characterisation as "Retour au programme" (⇔ Back to program), the value of this marker is "0".
Type ordre ⇔ Order type	Yes	Alphanumerical	Possible values: -implicite -explicite

[22] The Id of the offer made corresponds to the Id allocated automatically to an offer by the RTE SYGA application on its creation.

Field	Mand.	Format	Rules
Code implicite ⇔ Implicit code	No	Alphanumerical	Empty by default May be completed for a thermal BE and an implicit order. The list of possible implicit codes is: - "Empty" - PMD - PCmax - PC0max - PCrpmax - Pinter - PC0min - PCmin - MT.
Common info			
Dynamique Rapide ⇔ Rapid dynamic	Yes	Boolean (true/false)	N/A
Date/heure de début de l'ordre ⇔ Date/time when the order starts	No	Date/time – Format: DD/MM/YYYY hh:mm:ss	Its presence depends on the data item "Debut immediat" If the data item "Debut Immediat" is "true" then the data item is not entered

Field	Mand.	Format	Rules
Date/heure de fin de l'ordre ⇔ Date/time when the order ends	No	Date/time – Format: DD/MM/YYYY hh:mm:ss	Its presence depends on the data item "JNA" If the data item "JNA" is "true" then the data item is not entered

Field	Mand.	Format	Rules
Caractérisation ⇔ Characterisation	Yes	Alphanumerical	List of possible values: - Monter à ⇔ Increase to - Monter ⇔ Increase from - Baisser à ⇔ Reduce to - Baisser de ⇔ Reduce from - Maintenir à ⇔ Maintain at - Bloquer à ⇔ Block at - Passer à ⇔ Change to - Retour au programme ⇔ Back to program - Anticiper la hausse à ⇔ Anticipate increase to - Anticiper la baisse à ⇔ Anticipate reduction to - Couplage pour ⇔ Coupling for - Baisse en vue d'arrêt ⇔ Reduction due to stoppage - France vers etranger ⇔ France to other country - Etranger vers France ⇔ Other country to France - test[23], - "Empty"[24].
Valeur Puissance ⇔ Power Value	Yes	Numerical	In the case of an order with the characterisation "Retour au programme" the Power Value will be 9999
Unité Puissance ⇔ Power Unit	Yes	Alphanumerical	List of possible values: MW and GW MW by default
Valeur Réserve Primaire (RP) ⇔ FCR Value	Yes	Numerical	In the case of an order with the characterisation "Retour au programme" the FCR Value will be 9999
Unité RP ⇔ FCR Unit	Yes	Alphanumerical	List of possible values: MW and GW MW by default
Valeur Réserve Secondaire (RS) ⇔ aFRR Value	Yes	Numerical	In the case of an order with the characterisation "Retour au programme" the aFRR Value will be 9999
Unité RS ⇔ aFRR Unit	Yes	Alphanumerical	List of possible values: MW and GW MW by default
Nom du RO ⇔ RO Name	Yes	Alphanumerical	N/A
Nom Acteur Ajustement ⇔ Balancing Service Provider	Yes	Alphanumerical	N/A

[23] When the value of characterization field is "test", the order is not to implement and may have inconsistent data according to the offer of adjustment requested. The objective of a such order is to check the connection between RO and RTE.

[24] In this case the marker is present but not entered.

Field	Mand.	Format	Rules
Cause ordre ⇔ Cause of order	No(*)	Alphanumerical	(*) Mandatory for orders whose cause is "RSO". Not notified in other cases.
Date de mise à disposition de l'ordre dans TAO ⇔ Date order available in TAO[25]	Yes	Date/time – Format: DD/MM/YYYY hh:mm:ss	N/A
Date de recuperation de l'ordre du RO dans TAO ⇔ Date order retrieved by the RO from TAO[26]	Yes	Date/time – Format: DD/MM/YYYY hh:mm:ss	N/A

Xsd grammar

The attached files `Tao-Order.xsd` and `Tao-Orders.xsd` describe the exchange grammar to be followed, an extract from which is presented below:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<xs:schema version="1.0" xmlns:xs="http://www.w3.org/2001/XMLSchema">
        xs:element name="Ordre" type="Ordre"/>
        <xs:complexType name="EdA">
                <xs:sequence>
                        <xs:element minOccurs="0" maxOccurs="1" name="EdP" type="xs:string"/>
                </xs:sequence>
                <xs:attribute name="id" type="xs:string" use="required"/>
                <xs:attribute name="telereglage" type="xs:boolean" default="false"/>
                        </xs:complexType>
                        <xs:complexType name="Offre">
                                <xs:sequence>
                                        <xs:element minOccurs="1" name="Type" type="Type"/>
                                        <xs:element minOccurs="0" maxOccurs="1" name="CodeImplicite"
type="xs:string"/>
                                </xs:sequence>
                                <xs:attribute name="id" type="xs:string" use="required"/>
                                </xs:complexType>
                                <xs:simpleType name="Type">
                                        <xs:restriction base="xs:string">
                                                <xs:enumeration value="implicite"/>
                                                <xs:enumeration value="explicite"/>
                                        </xs:restriction>
                                </xs:simpleType>
                                <xs:simpleType name="Caracterisation">
                                [...]
                                </xs:restriction>
                                </xs:simpleType>
[...]
</xs:schema>
```

Examples of XML files

The files appended to this document listed below illustrate different XML flow scenarios.

[25] This availability date and time correspond to time T_0 described in §3. This date and time are synchronised on a GPS clock by a NTP (Network Time Protocol) system.

[26] This retrieval date and time correspond to time T_1 described in §3. This date and time are synchronised on a GPS clock by a NTP (Network Time Protocol) system.

Example 1: processing of the consultation returns an empty list.

- Filename: `recuperation_ordre_vide.xml`

Example 2: processing of the consultation returns a non-empty list of orders, including several unit orders from the list.

- Filename 1: `recuperation_ordres_RO1.xml`
- Filename 2: `recuperation_ordres_RO2.xml`

Example 3: Several examples of unit orders (i.e. a unit order from the list provided) corresponding to specific operational examples are provided in the appendices to this document.

5.4.2 Consultation flow for standard balancing orders

Functional description

During its automatic order consultation process, the RO M2M consults the TAO application to retrieve the list of the most recent standard balancing orders issued.
This flow describes this step in retrieving standard balancing orders. This service sends the calling RO all the standard orders concerning it in a single .xml file for which the TAO application is waiting for a response from the RO.

Main technical data

The table below details the flow technical data described in the swagger documentation.

Title	Field	Value	Description
URL	`<resource path>`	`/api/v1/ordres/std`	Context URL. This is the URL at which the service can be contacted. This is a URL relating to the TAO URL database and contains the name of the service
Méthode ⇔Method	`<method name>`	`GET`	Https method used • *POST* to edit/send information • *GET* to retrieve information
Question	`<request>`	`Not applicable`	Contains the XML description of the exchanged flow, as for XSD syntax. See "Input data"
	`<xs:grammars>`	`Not applicable`	
Réponse ⇔Replying	`<xs:grammars>`	`iec62325-451-7-activationdocument_v6_1.xsd`	Contains the XML description of the exchanged flow, as for XSD syntax. See "Output data"

Input Data

At consultation, the RO does not provide any data. It performs a simple GET.

Output Data

This part describes the file containing the list of standard orders produced by the TAO application in return in the "response" part of the standard order consultation service.
This description is based on three levels of information:

1. Presentation of the file containing the list of recovered data
2. Presentation of the XSD file of the exchanges,
3. Illustration with sample XML files.

Data exchanged

The file is described in the Excel file as an attachment "TAO-RO-SI EQ file format_v13", in the tab "5.4.2 output".

Xsd syntax

The file activationdocument_v6_1 describes the exchange syntax to be followed. It is associated with two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

All of these documents are attached.

Samples of XML files

Three sample xml files are attached:

- Recovery of three standard orders, on three different EDAs: 3_Ordres_standard_V2.xml
- No standard order: No standard order
- Empty standard order (test): Ordre_vide_standard

5.5. Balancing order response flow

5.5.1 Response flow to specific balancing orders

Functional description

The flow described in article specific Balancing order response flow allows sending of responses for acceptance or refusal of implementation of specific the balancing orders (see Step 3 described in article 3).
We will therefore describe here:

- The message of the responses to specific balancing orders issued by the RO and intended for the TAO system
- The acknowledgement message from TAO on receipt of the list of responses from the RO.

Main technical data

The table below details the technical data of the flow described in the wadl file `taoOrderService.wadl` appended to this document.

Title	Field	Value	Description
URL	`<resource path>`	`/rest/ordre/reponse`	Context URL. This is the URL through which the service can be contacted. It is a URL related to the TAO basic URL and contains the name of the service.
Méthode ⇔Method	`<method name>`	`POST`	https method used • *POST* to modify/send information • *GET* to retrieve information
Question	`<request>`	`ReponsesOrdres`	Contains the XML description of the flow exchanged, as for XSD grammar. See article Input data
	`<xs:grammars>`	`Tao-Reponse-Orders.xsd`	
Réponse ⇔Replying	`<response>`	`EtatReceptionReponsesROServeur`	Contains the XML description of the flow exchanged, as for XSD grammar. See article Output data data
	`<xs:grammars>`	`Tao-Reponse-Orders-Ack.xsd`[27] `Tao-EtatReception.xsd`	

Input data

This section describes the list of data issued by the RO in the "question" section of the service for response to specific Balancing Orders.
This description is given according to three levels of information:

1. Presentation of the list of data issued to TAO in response to each of the balancing orders
2. Presentation of the XSD file of exchanges
3. Illustration with examples from XML files.

[27] Le fichier `Tao-Reponse-Orders-Ack.xsd` utilise le fichier `Tao-EtatReception.xsd`. La balise xsd `<xs:import>` permet de réaliser cet inclusion.

Data exchanged

The table below details the data retrieved for each of the orders to be activated.

Field	Mand.	Format	Rules
Type de message ⇔ Message type	Yes	Text field (30 characters)[28]	Valued as "Reponse"
RO à l'origine de la réponse ⇔ OR originating response	Yes	Alphanumerical	N/A
Id de l'ordre objet de la réponse ⇔ Id of order that is the subject of the response	Yes	Alphanumerical 16 characters	N/A
Etat Réponse ⇔ Response Status	Yes	Boolean	false: accepted true: refused
Commentaire associé à la réponse ⇔ Comment associated with response	Yes	Text field (20 characters)	In the event of refusal, there are 4 types of comments accepted by the system TAO: - Non respect des CUO ⇔ Non-compliance with CUO - Ajustement a adapter ⇔ Balancing to be adapted[29] - Ajustement impossible ⇔ Balancing impossible - Autres ⇔ Other If the response is Accepted, the message is: -Ordre accepte ⇔ Order accepted
Date/heure de validation de la réponse ⇔ Date/time of validation of the response	Yes	Date/time Format DD/MM/YYYY hh:mm:ss	N/A

Xsd grammar

The attached file `Tao-Reponse-Orders.xsd` describes the exchange grammar to be observed.
An extract from this is presented below:

[28] 20 characters are defined for this field, in relation to potential future developments of the TAO system.
[29] During the period from 1st April to 1st October 2015, this value will change to "aju partiel possible" (the date will be notified to TAO users).

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<xs:schema version="3.0" xmlns:xs="http://www.w3.org/2001/XMLSchema">
	<xs:element name="ReponsesOrdres">
	<xs:complexType>
		<xs:sequence>
			<xs:element maxOccurs="unbounded" minOccurs="0" name="ReponseOrdre">
				<xs:complexType>
					<xs:sequence>
						<xs:element name="TypeMessage" type="TypeMessage"/>

						<xs:element name="RO" type="xs:string"/>
						<xs:element name="IdOrdre" type="xs:string"/>
						<xs:element name="EtatReponse" type="xs:string"/>
						<xs:element name="CommentaireReponse" type="xs:string"/>
						<xs:element name="DateReponseRO" type="xs:dateTime"/>
					</xs:sequence>
				</xs:complexType>
			</xs:element>
		</xs:sequence>
	</xs:complexType>
	</xs:element>

	<xs:simpleType name="TypeMessage">
		<xs:restriction base="xs:string">
			<xs:enumeration value="Reponse"/>
			<xs:enumeration value="Commentaire"/> <!-- pour version ulterieure -->
		</xs:restriction>
	</xs:simpleType>
</xs:schema>
```

Examples of XML files

The files appended to this document listed below illustrate different XML flow scenarios.

Example 1: Example of a list of responses made by a RO called "RO1".

- Filename: `Reponse_ordres_RO1.xml`

Example 2: Example of a list of responses made by a RO called "RO2".

- Filename: `Reponse_ordres_RO2.xml`

Output data

This section describes the acknowledgement of processing of the responses issued by the RO. This acknowledgement constitutes the "response" part of the service for response to orders to be activated.
This description is given according to three levels of information:

1. Presentation of the list of acknowledgement data produced by TAO and made available to the RO for each of its responses
2. Presentation of the XSD file of exchanges
3. Illustration with examples from XML files.

Data exchanged

The table below details the data retrieved for each of the orders to be activated.

Field	Mand.	Format	Rules
Accusé de reception ordre du serveur RO ⇔ Acknowledgement of receipt of the order from the OR server	Yes	Boolean	Possible values: - false: success - true: failure
Code retour en cas d'échec ⇔ Return code in the event of failure[30]	Yes	Numerical	Possible values: -11: "Le message est mal formaté" ⇔ The message is incorrectly formatted -12: "Une erreur technique est survenue" ⇔ A technical error has occurred -13: "La structure du fichier XML n'est pas correcte" ⇔ The xml file structure is incorrect -14: "Une réponse à cet ordre a déjà été réceptionnée" ⇔ A response to this order has already been received -10: "Le couplage TAO/Serveur RO n'est pas active" ⇔ TAO/RO Server coupling is not activated[31] -30: "Absence de réponse" ⇔ Lack of response[32]
Commentaire message Erreur ⇔ Error message comment	No	Alphanumerical	Entered depending on error type
Date/heure de reception de la réponse du RO serveur ⇔ Date/time of receipt of response from RO server	Yes	Date/time – Format DD/MM/YYYY hh:mm:ss	
Identifiant de l'ordre ⇔ Order identifier	Yes	Alphanumerical 16 characters	N/A

[30] These return codes will only be provided in the case of a request processed successfully from a http protocol point of view (i.e. code http 200).
[31] This code corresponds to deactivation in the TAO system of processing of requests in this service.
[32] This code corresponds to the sending of a response after the times given or to the lack of response to an order (see §3). Therefore, if an OR has not consulted an order within the time given or has not responded to an order within the time given, a code 30 related to this order will be returned the first time a response is sent after the time given.

Xsd grammar

The attached[27] files `Tao-Reponse-Orders-Ack.xsd` and `Tao-EtatReception.xsd` describe the exchange grammar to be observed.

An extract from this is presented below:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<xs:schema version="3.0" xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:import schemaLocation="Tao-EtatReception.xsd"/>
<xs:element name="EtatReceptionReponsesROServeur">
                <xs:complexType>
                <xs:sequence>
                        <xs:element minOccurs="0" name="EtatReception" type="EtatReception"/>
                        <xs:element maxOccurs="unbounded" minOccurs="0" name="EtatReceptionReponseROServeur">
                                <xs:complexType>
                                        <xs:sequence>
                                                <xs:element name="IdOrdre" type="xs:string"/>
                                                <xs:element name="AccuseReception" type="xs:boolean"
default="true"/>
                                                <xs:element name="DateReception" type="xs:dateTime"/>
                                                <xs:element minOccurs="0" name="EtatReception"
type="EtatReception"/>
                                        </xs:sequence>
                                </xs:complexType>
                        </xs:element>
                </xs:sequence>
                </xs:complexType>
        </xs:element>
</xs:schema>
```

Examples of XML files

The files appended to this document listed below illustrate different XML flow scenarios.

Example 1: All responses have been successfully integrated.

- Filename: `Reponses_ordres_ack - RO1 - succes.xml`

Example 2: Mixture of:

  - Successful integration of certain responses
  - Various types of errors possible during integration of an order, namely:
    - format error (11)
    - technical error (12)
    - response already received (14)
    - lack of response from the RO in the time given (30).
- Filename: `Reponses_ordres_ack - RO1 - mixe echec 11 12 14 30.xml`

Example 3: Failure on integration of responses / Global technical error

- Filename: `Reponses_ordres_ack - RO1 ou RO 2 - echec technique.xml`

Example 4: Failure on integration of responses / Global file structure error

- Filename: `Reponses_ordres_ack - RO1 ou RO 2 - echec structure.xml`

Example 5: Failure on integration of responses / Global error - coupling inactivated between TAO and OR

- Filename: `Reponses_ordres_ack - RO1 ou RO 2 - echec couplage.xml`

Example 6: Mixture of:

  - Successful integration of certain responses
  - An error related to an order Id received and unknown for this RO (12).
- Filename: `Reponses_ordres_ack - RO2 - mixe succes & echec 12.xml`

5.5.2 Response flow to standard balancing orders

Functional description

The stream described in §Balancing order response flow allows the sending of the acceptance or refusal of implementation of responses to standard balancing orders (see Step 3 described in §3).
We will describe here:

- The message of responses to standard balancing orders issued by the RO to the TAO application,
- The acknowledgement message from TAO upon receipt of the RO response.

Main technical data

The table below details the flow technical data described in the swagger documentation.

Title	Field	Value	Description
URL	<resource path>	/api/v1/ordres/std/response	Context URL. This is the URL at which the service can be contacted. This is a URL relating to the TAO URL database and contains the name of the service
Méthode ⇔Method	<method name>	POST	Https method used • *POST* to edit/send information • *GET* to retrieve information
Question			Contains the XML description of the exchanged flow, as for XSD syntax. See input data
	<xs:grammars>	iec62325-451-7-activationdocument_v6_1.xsd	
Réponse ⇔Replying	<xs:grammars>	iec62325-451-1-acknowledgement_v8_0.xsd	Contains the XML description of the exchanged flow, as for XSD syntax. See Outpu data

Input data

This section describes the list of data issued by the RO in the "question" section of the Specific Balancing Orders response service.
This description is based on three levels of information:

1. presentation of the list of the data issued by the RO to TAO in response to each of the standard balancing order files,
2. presentation of the XSD file of the exchanges,
3. illustration with sample XML files.

Data exchanged

The file is described in the Excel file as an attachment "Description flow TAO_v7.xslx guide", in the tab "5.5.2 entry".

This is the same format as for the submission of orders (Activation Market Document). The values of the annotated fields of an x cross are to be changed by the RO in relation to the file sent with the orders.

Xsd syntax

The file iec62325-451-7-activationdocument_v6_1.xsd describes the exchange syntax to be complied with. It is associated with two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

All of these documents are attached.

Samples of XML files

Three examples of xml files are attached, these are responses to the three standard orders in the example in §5.4.2 3_ "Ordres_standard.xml", on three different EDAs. One of the three orders is refused for technical constraint and the other two are accepted. Note that the responses are in three different files because they concern three different EDAs (see §3).
3_Ordres_standard_Reponse1_V5.xml
3_Ordres_standard_Reponse2_V5.xml
3_Ordres_standard_Reponse3_V5.xml

Output Data

This part describes the acknowledgement of acceptance of the processing of the responses issued by the RO. This acknowledgement is the "response" part of the order response service to be activated.
This description is based on three levels of information:

1. presentation of the list of acknowledgement data produced by TAO and sent to the RO for each of the files containing one or more responses.
2. presentation of the XSD file of the exchanges,
3. illustration with sample XML files.

Data exchanged

The file is described in the Excel file as an attachment "Description flow TAO_v7.xslx guide", in the tab "5.5.2 output".

Note: The section "Rejected_Timeseries" will only be completed in case of technical problem on the response to a given order, with the details of the error and the order number concerned. If the response to the order is technically valid, the "Rejected_Timeseries" section does not appear for the order concerned. In the file header there is a reference to the document to which this acknowledgement message is attached, which allows the identification of all orders to which this acknowledgement message refers.

Xsd syntax

The file iec62325-451-1-acknowledgement_v8_0.xsd describes the exchange syntax to be complied with. It is associated with two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

All of these documents are attached.

Samples of XML files

Two examples of xml file are attached, this is the acknowledgement following the RO response from §5.5.2 above "3_Ordres_standard_Reponse1_V3.xml"

Example 1: The response is technically valid
`Acquittement_OK_3_Ordres_standard_Reponse1.xml`

Example 2: Response has already been received for this order
`Acquittement_KO_3_Ordres_standard_Reponse1_V2.xml`

5.6. Final Dispatch Schedule submission flow following acceptance of one or more standard or specific orders

Functional description

The flow described in this section allows the sending of the PM(s) following acceptance of one or more specific or standard order(s) (see Step 4 described in §)3).
We will describe here:

- The file containing one or more PM(s) issued by the RO to the TAO application
- TAO acknowledgement message: This message will contain the result of the technical and business controls, whether or not the Final Dispatch Schedule is validated, and any warnings.

Main technical data

The table below details the flow technical data described in the swagger documentation.

Title	Field	Value	Description
URL	<resource path>	Warning: standard and specific PMs must be sent to two different URLs: **Standard Final Dispatch Schedule APIs:** /api/v1/ordres/std/pm **Specific Final Dispatch Schedule APIs:** /rest/ordre/PM	Context URL. This is the URL at which the service can be contacted. This is a URL relating to the TAO URL database and contains the name of the service
Méthode ⇔Method	<method name>	POST	Https method used • *POST* to edit/send information • *GET* to retrieve information
Question			Contains the XML description of the exchanged flow, as for XSD syntax. See Input data
	<xs:grammars>	Multiple_Schedule_v1_1.xsd	
Réponse ⇔Replying			Contains the XML description of the exchanged flow, as for XSD syntax. See Output data
	<xs:grammars>	Multiple_Schedule_v1_1.xsd	

Input data

This section describes the list of data issued by the RO in the "question" section of the Final Dispatch Schedule submission service.
This description is based on three levels of information:

1. presentation of the list of data issued by RO to TAO to describe the PMs
2. presentation of the XSD file of the exchanges,
3. illustration with sample XML files.

Data exchanged

The file is described in the Excel file as an attachment "Description flow TAO_v7.xslx guide", in the tab "5.6 entry".

Note: For a given Final Dispatch Schedule, the 5 curves (PA, RPH, RPB, RSH, RSB) are expected. If no FCR and/or aFRR exists, enter 0 in the field(s) concerned.

Xsd syntax

The Multiple_Schedule_v1_0xsd file describes the exchange syntax to be complied with. It is associated with two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

All of these documents are attached.

Samples of XML files

An example xml file is attached, which is a Final Dispatch Schedule for an EDA containing two EDPs, referring to a standard order.
PM_SO_ABCDEFG1_V6.xml

Output Data

This part describes the acknowledgement of acceptance of the processing of PMs issued by the RO. This acknowledgement is the "response" part of the Final Dispatch Schedule dispatch service.
This description is based on three levels of information:

1. presentation of the list of acknowledgement data produced by TAO and sent to RO for each file containing one or more Final Dispatch Schedule.
2. presentation of the XSD file of the exchanges,
3. illustration with sample XML files.

Data exchanged

The file is described in the Excel file as an attachment "Description flow TAO_v7.xslx guide", in the tab "5.6 output".

Note:
- For the warning message: "Warning: the Final Dispatch Schedule of entity X is missing." A Timeseries will be created with the entity code missing in the mRID and the warning message.

- The "Series" part (= Curve level) will not be indicated if there is no business warning at the Curve level
- The part "ResourceSchedule_TimeSeries" (= Final Dispatch Schedule level) will not be indicated if there is an overall technical error (the code of the global Reason for the file: A02)

Xsd syntax

The Multiple_Schedule_v1_0.xsd file describes the exchange syntax to be complied with. It is associated with two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

All of these documents are attached.

Samples of XML files

Three examples of xml files are attached, this is the acknowledgement following the sending of the Final Dispatch Schedule of §5.6 above "PM_SO_ABCDEFG1_V6.xml" by the RO.

Example 1: The Final Dispatch Schedule is technically accepted but contains business warnings.
Acquittement_Avertissements_PM_SO_ABCDEFG1_V6.xml

Example 2: There are technical problems.
Acquittement_KO technique_PM_SO_ABCDEFG1_V6.xml

Example 3: The Final Dispatch Schedule is technically accepted and there is no business warning.
Acquittement_OK_PM__SO_ABCDEFG1_V5.xml

5.7. Summary of Xsd Models and XML examples of the various flows

This Table is a summary of the xsd exchange file models and examples of XML files for illustrating exchanges between RTE and the RO through the M2M interface.

Description of Flow	Action	Message Content	Service	Xsd	Xml	Data Description
Récupération des ordres spécifique à activer ⇔ Retrieval of specific orders to be activated	GET	<request>: not applicable	retrieveOrders	none	none	See article Input data
		List of orders to be activated for the M2M OR <response>: «Ordres»		Tao-Order.xsd Tao-Orders.xsd	List of empty orders recuperation_ordre_vide.xml List of non-empty orders recuperation_ordre_RO1.xml recuperation_ordre_RO2.xml	See article Output data
Récupération des ordres standard à activer ⇔ Retrieval of standard orders to be activated	GET	<request> : not applicable		none	none	See article 5.4.2
		<response> :		iec62325-451-7-activationdocument_v6_1.xsd	3_Ordres_standard_V2.xml	
Traitement des réponses du RO	POST	Response from the M2M RO to orders to be activated	reponse	Tao-Reponse-Orders.xsd	Lists of orders accepted and refused Reponse_ordres_RO1.xml	See article Input data

M2M aux orders spécifiques à activer ⇔ Processing of responses from the M2M RO to specific orders to be activated		<request>: «ReponsesOrdres»			Reponse_ordres_RO2.xml	
		Acknowledgement from TAO after processing of the list of responses <response>: «EtatReceptionReponsesROServeur»		Tao-Reponse-Orders-Ack.xsd Tao-EtatReception.xsd	Successful integration of all responses Reponses_ordres_ack - RO1 – succes.xml Successful integration of certain responses only + different types of error possible on integration of an order (formatting error (11) – technical error (12), response already received (14), lack of response from RO in the given time(30)) Reponses_ordres_ack - RO1 - mixe echec 11 12 14 30.xml Acknowledgement failure - technical error Reponses_ordres_ack - RO1 ou RO 2 - echec technique.xml Acknowledgement failure – file structural error Reponses_ordres_ack - RO1 ou RO2 - echec structure.xml Acknowledgement failure – coupling error between TAO and the OR Reponses_ordres_ack - RO1 ou RO2 - echec couplage.xml	See article Output data

					Successful integration of certain responses only + failure due to an unknown order Id (15) `Reponses_ordres_ack - RO2 - mixe succès & echec 15.xml`	
Traitement des réponses du RO M2M aux ordres standard à activer ⇔ Processing of responses from the M2M RO to standard orders to be activated	POST	RO M2M response to standard orders to enable		`iec62325-451-7-activationdocument_v6_1.xsd`	3_Ordres_standard_Reponse1_V5.xml 3_Ordres_standard_Reponse2_V5.xml 3_Ordres_standard_Reponse3_V5.xml	See acticle 5.5.2
		TAO acknowledgement Following processing of file containing one or more responses		`iec62325-451-1-acknowledgement_v8_0.xsd`	Acquittement_OK_3_Ordres_standard_Reponse1.xml Acquittement_KO_3_Ordres_standard_Reponse1_V2.xml	
Envoi d'un fichier contenant un ou plusieurs PM suite à l'acceptation d'un ou plusieurs ordre(s) ⇔ Submitting a file containing one or more PMs upon acceptance of one or more order(s)	POST	Final Dispatch Schedule submission		`Multiple_Schedule_v1_1.xsd`	PM_SO_ABCDEFG1_V6.xml	See article 5.6
		TAO acknowledgement as a result of processing the file containing one or more Final Dispatch Schedule		`Multiple_Schedule_v1_1.xsd`	Acquittement_Avertissements_PM_SO_ABCDEFG1_V6.xml Acquittement_KO technique_PM_SO_ABCDEFG1_V6.xml Acquittement_OK_PM__SO_ABCDEFG1_V5.xml	

Note: the xsd ENTSOE are associated with the following two Codelists:

urn-entsoe-eu-local-extension-types.xsd

urn-entsoe-eu-wgedi-codelists.xsd

6. Balancing order availabity process to GRDs

In order to acknowledge GRDs about balancing orders impacting their distribution network, these orders are made available by RTE through TAO system.

The balancing order availability process to GRDs comes within the process presented in §3 as following :

- Once a RO sent a response to an order, if the response is an acceptance then the data (as described in article 7) concerning this order are made available for impacted GRDs.
- The GRD interrogates the TAO system to consult the balancing order made available. This consultation is to be carried out by the "GRD GUI" interface, depending on the recommendations given in article 7.

7. Implementation with GRD GUI Interface

7.1. Connection to the RTE IT system

In order to be able to use the GRD GUI Interface of the TAO system, a GRD has to make a request to its CRC (Account manager).

At the end of this request, an electronic key for connection to the RTE IT (PKI certificate, in the form of a PKCS#12 file, i.e. the extension of which is ".p12"), dedicated for access to the TAO system, is supplied to the GRD. This key should be installed by the GRD according to the methods described in reference document [2].

7.2. Description of the exchange interface

Connecting the GRD GUI exchange interface

The Web GUI Interface of the system can be accessed with a web browser, using an electronic key for connection to the RTE IT (see article Connection to ther RTE IT system), at the following url :

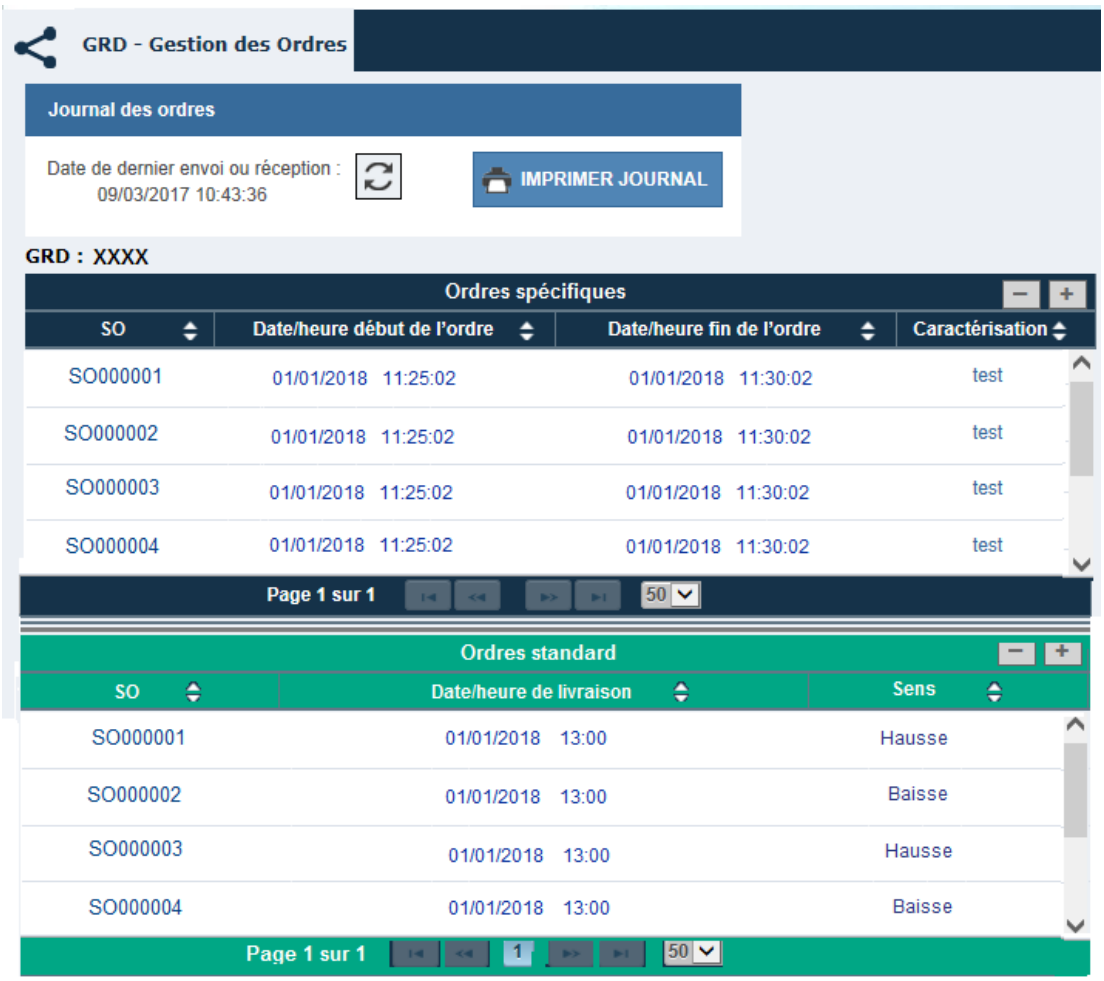
Solution for access to the RTE IT (see article 2)	Type of access	Connection URL
RTE FO access	Internet	https://portail.iservices.rte-france.com/tao/
TAO test platform[33]	Internet	https://portail-dev.iservices.rte-france.com/tao/ https://portail-metier.services.rte-france.com/tao/

The GRD GUI of the TAO system is "thin client" type. More specifically, the web pages can be displayed with Microsoft Edge Chromium without any additional plug-in. RTE only guarantees operation with this browser.

Operation of the GRD GUI Interface

The GRD GUI Interface is presented to the RO in the following format in the web browser[34]:

[33] This platform is available to customers who wish to test TAO system. A PKI certificate dedicated to this platform is to ask to his relationship account manager.
[34] The data presented in the image does not correspond to any real relevant case.



This interface offers the GRD the following features (detailed in the paragraphs below):

- See specific orders log (list of orders presented in the interface and their main associated data),
- See standard order log (list of orders presented in the interface and their main associated data),
- Update the specific and standard order log
- Print the specific and standard order log.

Consult the order log

The interface allows the RO to consult the list of balancing orders concerning it, in which the dates of availability (see article 0) in the TAO system are later than the current date less 2 days.

This log also presents the main data associated with each of the orders, i.e.:

- Be associated with the balancing order
- Date and time when the order starts
- Date and time when the order ends
- Characterization associated with the order.

The log allows the GRD to sort the list of orders according to each of the data items mentioned above.

Update the order log

A button on the Web GUI Interface allows the GRD to update the order log.

Clicking on this button thus leads to a consultation of the orders available to the TAO system (see article 0) and update of the list of specific and standard orders, and the main associated data.

The order log update button is as follows: 

Print specific and standard order log

A "PRINT LOG" button is available in the Distribution System Operator HMI interface. Clicking this button allows the Distribution System Operator to print the specific order log and the standard order log in .csv format. Both files will be downloaded to a .zip folder

The order log print button is located at the top left.

7.3. HMI data Distribution System Operator in XML format

A URI is made available to Distribution System Operators to obtain in XML the data displayed in the Distribution System Operator HMI.

Management rules

The same HMI consultation rules (see §Operation of the Distribution System Operator HMI interface - 7.2) apply.

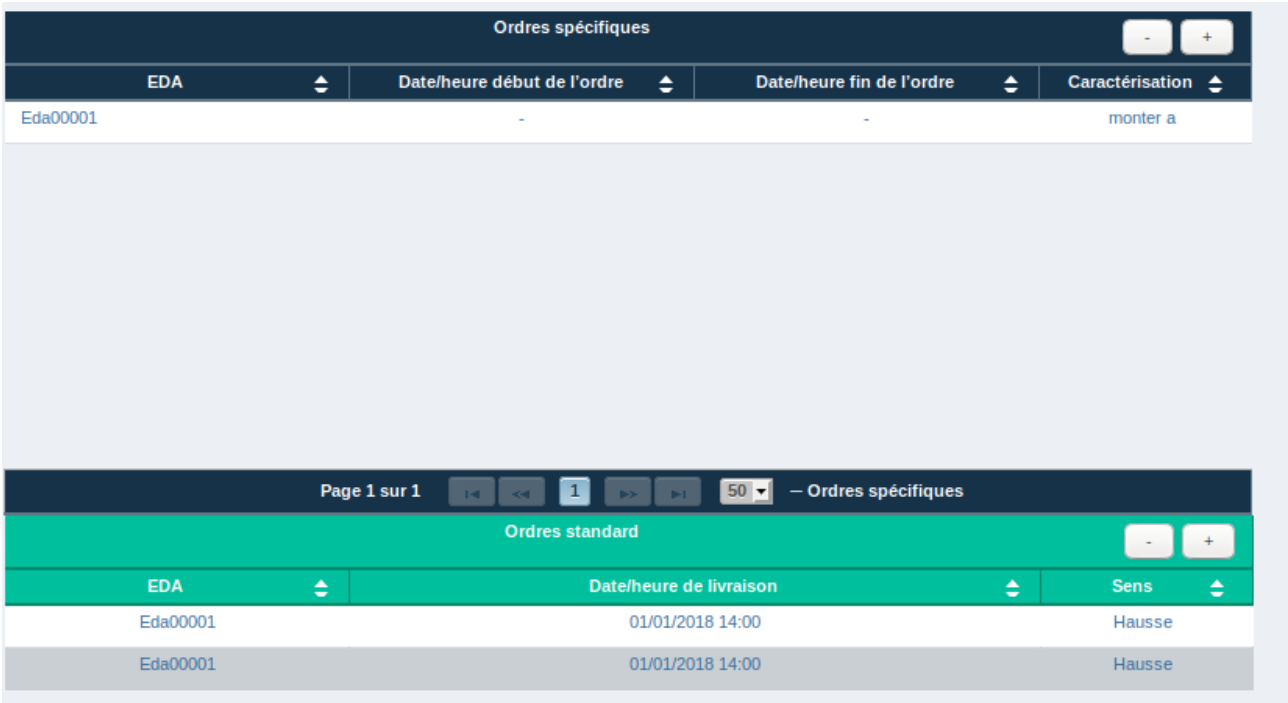
The Forecast Dispatch URL is: https://<tao_login_URL>/pages/grd/accueil.jsf
(see §Connection to the Distribution System Operator HMI exchange interface - 7.2 for the URL <tao_login_URL>).

The authentication is identical to that of the URL giving access to the HMI (see §7.1).

The XML XSD is available as an attachment to this document (see TAO_GRD.xsd).

Below is an example to compare:

- HMI data



- Les données au format XML :

```
- <xml>
  - <spcs>
    - <spc>
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8. Definitions and glossary of abbreviations

8.1. Definitions

All words or groups of words used in this document that begin with a capital letter have the meanings attributed to them in Article 1 of the Rules relative to Programming the Balancing Mechanism and the Recovery of Balancing Charges.

8.2. Glossary of abbreviations

AA / BSP	Balancing Service Provider (BSP)
CUO	Bid usage Conditions
DMO	Mobilisation Leadtime of the Offer : time needed for operations for activation of an Offer by a BSP.
DP	Preparation Leadtime
EDP	Scheduling Entity
EDA	Balancing Entity
EDR	Reserve providing entity
FO	Optical Fiber
GRD	Gestionnaire de Réseau de Distribution (Local Distribution Company)
HTTPS	HyperText Transfer Protocol Secure
I	Frequency of requesting in "M2M" operation - Time interval between each interrogation defined on article 5.
GUI	Graphical User Interface
IP-VPN	Internet Protocol – Virtual Private Network
M2M	Machine To Machine operation
OA	Balancing Order
PKI (Certificate)	File for identifying a user (Public Key Infrastructure)
PM	Final Dispatch Schedule
PA	Forecast Dispatch Schedule
REST	REpresentational State Transfer is a style of architecture for distributed hypermedia systems

RO	Order Recipient
Web GUI RO	Order recipient only having balancing resources with DMO > 30 minutes
M2M RO	Order recipient having at least one balancing resource with DMO ≤ 30 min
RR /RC	Rapid Reserve / Complementary Reserve
IS or IT	Information Technology
T0	Date/time of availability by TAO of the order for the RO concerned
T1	Date/time of consultation of order by the RO
T2	Date/time the RO sent the response following a balancing order
Q1	Date/time of consultation of the order by the OR
URL	Web Address (Uniform Resource Locator)
WADL	Web Application Description Language. XML/based file that makes it possible to describe REST applications. Its main purpose is to describe the services offered by an application on the internet.
XML	eXtensible Markup Language is a generic markup computer language
FCR	Frequency Containment Reserve
aFRR	Automatic Frequency Restoration Reserve
CRC	Customer Relationship Officer
RPh	Frequency Containment Reserve Time series Upward
RPb	Frequency Containment Reserve Time series Downward
RSh	Frequency Restoration Reserve Time series Upward
RSb	Frequency Restoration Reserve Time series Downward

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APPENDICES

Several examples of unit orders corresponding to specific operational examples are described below (with an associated graphic description and the names of the XML transcription files appended to this document):

No.	***Balancing requested***	***Actor type***	***Transcription file***
1	**From 06:00 to 08:30 Increase to (PCmax, 200,20,0)**	*Injection*	`Example 1.xml`
2	**From 06:30 to 08:30 reduce by 20 MW**	*Extraction/aggregator*	`Example 2.xml`
3	**From now until 8:00 reduce to 80 MW with teleregulation** (operating point: 80, 10, 5)	*Hydroelectric injection*	`Example 3.xml`
4	**From now until 8:00 increase by 50 MW without teleregulation**	*Hydroelectric injection*	`Example 4.xml`
5	**From now, reduce to (PCmin,50,10,0) until further notice**	*Injection*	`Example 5.xml`
6	**From now, reduce by 40 MW until further notice**	*Extraction/aggregator*	`Example 6.xml`
7	**From now, block at (PCinter,120,15,0) until 8:30**	*Injection*	`Example 7.xml`
8	**From now, maintain at 130 MW until further notice** (operating point in progress: 130, 20, 15)	*Hydroelectric injection*	`Example 8.xml`
9	**From now, return to Forecast Dispatch Schedule** (existence of balancing prior to this order – operating point of PA: PCinter, 100, 10,5)	*injection –*	`Example 9.xml`
10	**From now, anticipate increase to (PMD, 200, 0, 0) until 7:15**	*Injection*	`Example 10.xml`
11	**Coupling of BE1 to reach (PC0inter, 100, 20, 7) at 11:15 until 15:00**	*Injection*	`Example 11.xml`
12	**From 15:00 reduce with a view to stoppage of BE1**	*Injection*	`Example 12.xml`
13	**From 08:00, increase by 60 MW until further notice**	*Extraction/aggregator*	`Example 13.xml`
14	**From now, maintain at 100 MW until 10:00** (operating point in progress: 100, 15, 5)	*Injection*	`Example 14.xml`
15	**Activate BE 15 from Another Country to France at a power of 500 MW from 8:00 to 11:00**	*Foreign BE*	`Example 15.xml`
16	**Activate BE 16 from France to Another Country at a power of 200 MW from 8:00 to 11:00**	*Foreign BE*	`Example 16.xml`
17	**From 7:30, reduce to (PC0max, 180, 20, 10) until 10:30**	*Injection*	`Example 17.xml`
18	**From now, increase by 10 MW until 11:00**	*Extraction (load reduction)*	`Example 18.xml`
19	**From now, increase by 10 MW until 11:30**	*Aggregator*	`Example 19.xml`

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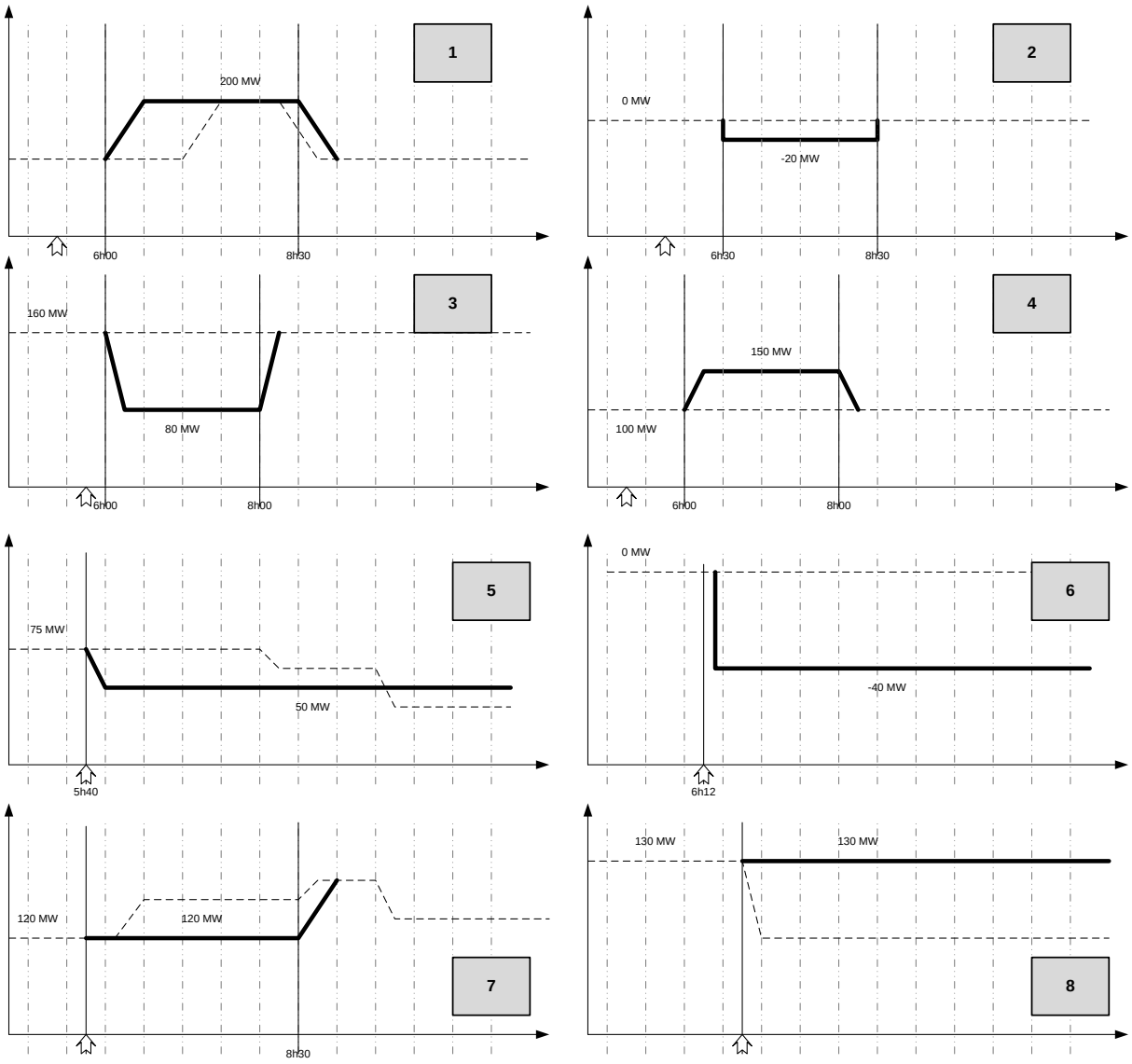

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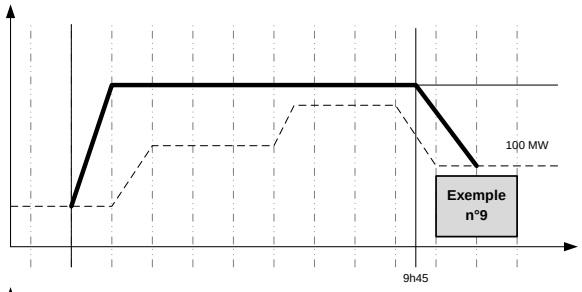

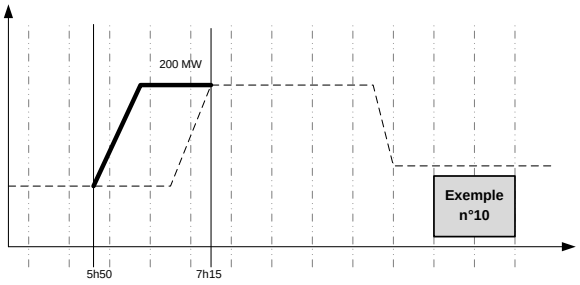

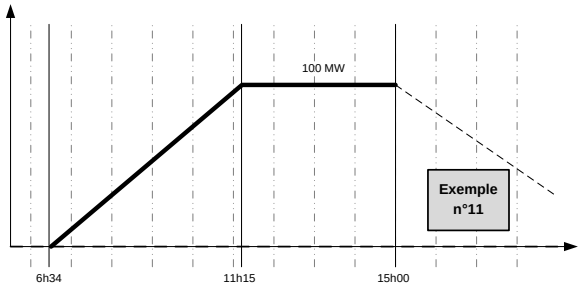

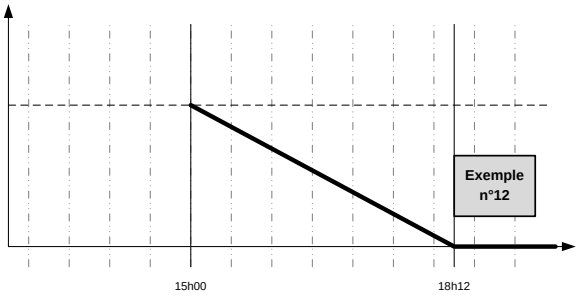

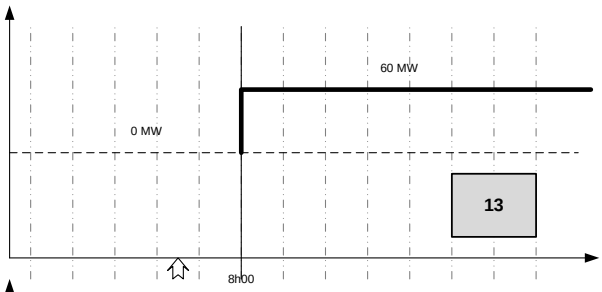

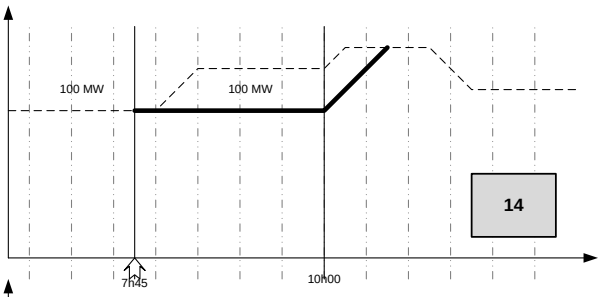

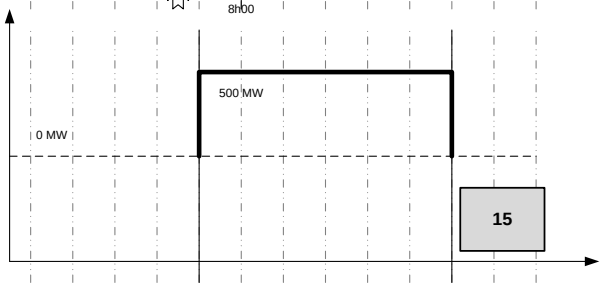

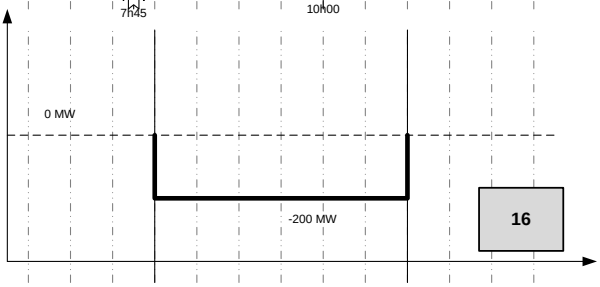

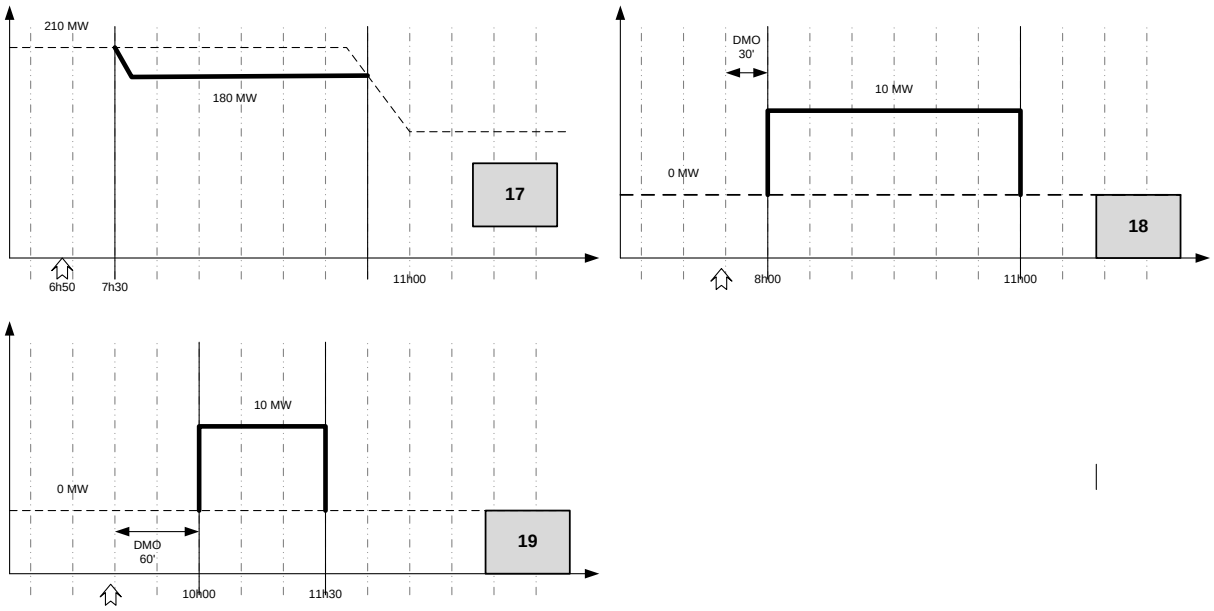

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