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# Fast Reserve System Set up for Ancillary Service Provider

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## DOCUMENT CONTROL

### Change History

VERSION	DATE	CHANGES
0.1	19/04/2018	Draft version
1.0	02/05/2018	First published version
1.1	28/05/2018	Changes to the backend error messages and to the business logic
1.2	04/06/2018	Minor changes
1.3	30/10/2018	Rules about max occurrences; DateTimeStamp validation changes; other exception changes
1.4	05/03/2019	Added changes for OCP FR
1.5	25/11/2019	Changes for EBGL + Window CrossOver Scenarios
1.6	14/08/2020	Introduction of perpetual nominations, clarifications for cease instruction and minor text changes.
1.7	24/08/2020	Added examples to support the clarifications included in v1.6 for cease instruction timing.
1.8	22/06/2021	<ol style="list-style-type: none"> <li>1. Changes done under 'Dispatch/Cease service' section:               <ol style="list-style-type: none"> <li>1.a. To ensure the VolumeRequested attribute is validated with reference to current window MW.</li> <li>1.b. Updated workflow to be followed in ASDP after receiving an error response from the service provider corresponding to a unit.</li> </ol> </li> <li>2. Changes done in 'Settlement Metering service' section to ensure any settlement metering data should come from the service provider after the start of the service term of a particular unit.</li> </ol>
1.9	07/12/2022	Changes made in section 3.3 pertaining to Availability Redecoration

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## 1 Introduction

The PAS (Platform Ancillary Services) project has an objective to replace and enhance systems across the ancillary service lifecycle. Starting with a flexible dispatch platform, capable of sending and receiving data, such as provider availability submissions and dispatch notifications. The platform is being rolled out to include Fast Reserve initially and this documents focuses solely on the Fast Reserve Service. In order for Service Providers to communicate with National Grid ESO (NG ESO) they are required to develop a system along with the appropriate web services as per the technical specifications.

This document explains the business rules Service Providers need to implement, including the initial set up of the system and the exceptions rules for the web services.

### 1.1 Scope

This document applies to Non BM providers only and covers the business rules and exceptions which are to be implemented by Fast Reserve service providers and this document covers both the Firm and Optional Fast Reserve Service.

## 2 Initial System Set-up Business Rules

The tender for the firm service is run each month, once the contract has been accepted the contract data will be placed into the PAS application and the web service urls will be placed in the National Grid ESO middleware. Each of the web service urls will be tagged against a Contract ID (for the purpose of this documents, the contract id is your unique Unit id Provider by National Grid ESO Support Team) and the dynamic routing will happen from National Grid ESO middleware.

The following data items are applicable for both the Firm and Optional Fast Reserve (FR) Service

Data Item	Description
Contract ID	ID of a contract, this will match the Unit ID (Service Provider can have multiple contracts)
Contract Start Date	Start date of contract as per Firm tender or Optional Framework Agreement
Contract End Date	End date of contract as per Firm tender or continually renewed for Optional Units
Contracted MW	in respect of a Type 1 Contracted Site only, means the maximum respective change in the level of energy production or consumption in MW for such Type 1 Contracted Site which the Fast Reserve Provider may be instructed by National Grid ESO to provide from the Type 1 Contracted Site when delivering Fast Reserve more particularly specified in the Fast Reserve Framework Agreement (as the same may be revised from time to time in respect of the Firm Service in accordance with sub-paragraph 2.3.2(d)(ii);

Optional MW	The is the MW which will be associated with the framework agreement. This will be used as a cap for the largest submission a unit could send for an optional window
Firm Availability Fee	means the fee described as such forming part of the Tendered Service Parameters;
Optional Availability Fee	means the payment rate described as such set out in the Fast Reserve Framework Agreement as revised from time to time pursuant to sub-paragraph 4.3.3(c)
Firm Utilisation Price	A default price which will be set at the start of a Firm Contract, this can be changed as mentioned in <a href="#">availability</a> section
Optional Utilisation Price	A default price which will be set unit is setup , this can be changed as mentioned in <a href="#">availability</a> section
Response Time	means either in respect of (1) a Contracted BM Unit, the period of time required to submit the necessary Dynamic Parameters in accordance with subparagraphs 3.3.1(c)(i) specified in the Fast Reserve Framework Agreement for each Contracted BM Unit commencing on the time of issue by National Grid ESO of a request pursuant to sub-paragraph 3.3.1(a), or (2) a Contracted Site, in relation to any Instruction or Firm Instruction, the period set out in the Fast Reserve Framework Agreement, commencing on the time of issue of that Instruction or Firm Instruction;
Max Utilisation Period	means, in relation to any Instruction, the period set out in the Fast Reserve Framework Agreement, beginning on commencement of provision of Optional Fast Reserve;
Recovery Time	means, in respect of a Contracted Unit, the period set out in the Fast Reserve Framework Agreement, beginning at the time when the Contracted Unit ceases provision of Optional Fast Reserve;
Minimum Non Zero Time	means, in respect of a Contracted Unit, the period set out in the Fast Reserve Framework Agreement, the time period until which the Unit has to run after dispatch before cease can be provisioned
Ramp Up	in respect of the Contracted Site, the minimum rate of decrease in the import of Active Power to the Premises from the National Electricity Transmission System or the increase in the export of Active Power from the Premises to the National Electricity Transmission System (as the case may be) expressed in MW/minute and set out in the Fast Reserve Framework Agreement;

Ramp Down	in respect of the Contracted Unit, the minimum rate of increase in the import of Active Power to the Premises from the National Electricity Transmission System or the decrease in the export of Active Power from the Premises to the National Electricity Transmission System (as the case may be) expressed in MW/minute and set out in the Fast Reserve Framework Agreement;
Max MWhrs Daily	The max number of MWhrs only during an Operational day. This limit is split into firm and optional explained in the table below
Max Occurrence Daily	The max number of occurrences for firm windows in an Operational day.
Max MWhrs per Settlement Period	The max number of MWhrs only during a firm Settlement Period.
Max Occurrence per Settlement Period	The max number of occurrences only during a firm Settlement Period.
Max MWhrs per service period	The max number of MWhrs only during a firm window.
Max Occurrence per service period	The max number of occurrences only during a firm window.
Max MWhrs per Service Term	The max number of MWhrs within the contract term for Firm Windows
Max Occurrence per Service Term	The max number of utilisations within the contract term for Firm Windows
Minimum Nomination Time	The minimum time between the start time of an Arm and end time of a Disarm.
Telephone	Telephone number that National Grid ESO Electricity Control Room can call in the event of a manual intervention

The following is the table which provides detail on the max utilisation limits

Time	Occurrence	MWhrs
Service Term (Contract term)	Applicable only to firm windows	Applicable only to firm windows
Service Period (Window)	National Grid ESO counts the number of occurrences only during the firm windows.	National Grid ESO counts the number of MWhrs only during the firm windows.
Firm Operational Day	Applicable only to firm windows	Applicable only to firm windows
Optional Operational Day	Not applicable	Applicable only to optional windows
Settlement Period	National Grid ESO counts the number of occurrences only during the firm windows.	National Grid ESO counts the number of MWhrs only during the firm windows.

If a contract has been accepted via the monthly tender process, the contract will be considered as a Firm Fast Reserve contract. The tendered availability windows for that contract will be considered as 'Firm' availability windows. The availability windows which are not tendered would be considered as an optional availability window. For example, if the tendered windows in a day are between 05:00:00 on 10-May-2018 to 08:00:00 on 10-May-2018 and 16:00:00 on 10-May-2018 to 20:00:00 on 10-May-2018, these will be considered 'Firm' availability windows whereas the windows 08:00:00 on 10-May-2018 to 16:00:00 on 10-May-2018 and 20:00:00 on 10-May-2018 to 05:00:00 on 11-May-2018 will be considered as optional windows.

Following the monthly tender if the Service provider was unsuccessful the tender could be considered for the optional service.

National Grid ESO will assume the following availability:

- Firm Contract:
  - Firm Window : Default available
  - Optional Window : Default not available
- Optional Contract:
  - All Optional Windows : Default not available

**Please note** that Firm Fast Reserve and Fast Reserve are used interchangeably in this document.

## 2.1 European Balancing Guidelines (EBGL) Changes

As of 31<sup>st</sup> of January the EBGL changes for firm and optional windows will come into force. Exact implementation date will be confirmed by National Grid ESO Account Managers. The changes which are relevant to the dispatch system through PAS are mentioned below in a high level and in detailed throughout the relevant sections.

- 1) Utilisation prices for Firm or Optional windows can now be changed up until gate closure as part of availability submission
- 2) Availability prices for Optional windows can now be submitted up until gate closure
- 3) Optional Window MWs can be submitted less than the framework MWs

For detailed information see the [availability](#) section.

## 3 Web Services Business Rules and Exceptions

### 3.1 General business rules and exceptions

In all the web services and for all the data tags, the data should be trimmed and should be without any spaces before or after the data. For example, National Grid ESO would expect 'Fast Reserve' instead of 'Fast Reserve ' or ' Fast Reserve' in the service type.

The web service will not be accepted if Service Providers send any blank tags. This will mean the 'NULL' value will be updated in the PAS system. This is applicable for all the optional fields. If the field is optional, National Grid ESO would expect Service Provider to ignore that tag completely from the payload.

If Service Provider sends blank tag for mandatory tags, PAS will update 'NULL' value in the system if there are no validations mentioned in this document.

Except for dispatch / cease instruction web service (which is for 10 seconds), National Grid ESO will wait for 1 minute before it will time out.

National Grid ESO has made a provision for its systems and Service Providers' systems to be out of sync only by 1 minute. This is reflected in all the DateTimeStamp validations for all web services.

### 3.2 Web Service Versioning

In Web Service Specification, we have introduced web service versioning to help with traceability for onboarding new Ancillary Services. Service Providers will need to adhere to version 1 for Fast Reserve contracts. A further update will be provided to all affected Service Provider when version 2 will be made available. National Grid ESO will tentatively plan to decommission version 1 web services in April 2021. Any changes to the web service specification or business logic document will be communicated to all service providers with appropriate notice period to accommodate changes at their end.

### 3.3 Availability Service

This web service is used for re-declaration of availability window in a Firm Fast Reserve contract. It is also used to re-declare optional availability window. In a normal situation, National Grid ESO would expect to see declarations and re-declarations from Service Providers (SP) in advance of before gate closure of any given window. The StartDateTime and EndDateTime should be in the future. In normal situations, National Grid ESO will reject any declaration / re-declaration which are sent after Gate Closure – except in the case of an emergency re-declaration. Providers are able to send emergency re-declarations after the gate closure until the end of availability window.

For example, if the window is from 10:00 to 19:00, a SP can submit an emergency declaration from 09:00 to 18:59 and the StartDateTime should be 10:00, EndDateTime should be 19:00 and the BreakPointforOffer1Bid1 value should be '0'.

For settlement purposes, National Grid ESO will consider the DateTimeStamp as StartDateTime in the case of emergency re-declaration if the submission is sent after the window has started. It should be noted that SP has responsibility to submit the re-declaration of any adjoining window with a contracted MW '0' in case they have submitted emergency re-declarations. Otherwise, National Grid ESO will assume that SP is available for the next adjoining window and could send a dispatch notification.

In the scenario where a dispatch instruction has been confirmed after which SP sends an emergency re-declaration, National Grid ESO would be sending cease instruction as mentioned in section 3.7. The time when emergency re-declaration is sent is considered to be the time of cease confirmation for settlements purposes.

National Grid ESO expects to only have ServiceType, ContractID, StartDateTime, EndDateTime, BreakPointforOffer1Bid1 (MW), OfferPriceforOffer1Bid1 (£/MWh – Utilisation Price), Offer1\_AvailabilityPrice (£/MWh – Availability Price) and DateTimeStamp in the payload. For all the windows that needs to be re-declared by the SPs, National Grid ESO expects above mentioned fields in availability request payload. The exceptions such as submitting pricing information is mentioned below.

National Grid ESO would expect a SP to send a re-declaration for the entire FIRM/Optional window period.

#### **Variable Optional MWs:**

Service Providers can submit between their Framework MW and the FR minimum MW (25 MW) value for optional window using BreakPointforOffer1Bid1 through re-declaration, ensuring that the MW is also a whole number i.e 26 or 30 and not 26.5 or 30.5. In the event a SP does not submit an availability for an optional window, National Grid ESO will assume zero availability for that window.



If SP wants to change the existing declaration of optional window but also extend the declaration to the next availability window, both of these have to be considered as separate windows but could be sent in a same payload.

As mentioned in the technical specification, SP's can submit multiple availability re-declaration windows within the same payload.

### **Submitting availability or utilisation price in the webservice:**

Due to the changes of the 2020 EBGL, providers are now be able to submit a change in utilisation price up until gate closure (60 minutes before the start of the Window) for both firm and optional window. This is live from 31<sup>st</sup> January 2020 for both firm and optional windows. Before this optional window rules will remain at the existing week ahead as implemented previously on 2019 [OCP](#)

The logic of submitting Availability price for optional windows will also be allowed up until gateclosure. Service Providers can still use the offline mechanism to submit their prices to National Grid ESO. Because it is a manual process, Service Providers need to give National Grid ESO enough notice for the PAS Support Team to acknowledge and change the prices in National Grid ESO system(s).

Any re-declarations which are not submitted with a utilisation or availability price, will use the default price values if price has not been submitted in the earlier declarations/re-declarations. However, if there was a previously submitted price for the given window, the system will take those values for the pertinent window.

**Scenario 1:** If Service Provider wants to have (availability and / or utilisation) pricing different to the contracted prices for a particular window, the re-declaration should be sent with the changed prices within the above mentioned timescales. In the event where no price has ever been declared for that window, it will default to the contract/default setup pricing.

**Scenario 2:** If Service Providers want to setup a price change (utilisation or availability) for all optional windows for the entire contract period, they can send initial declaration for all future windows with 0 MW and send re-declaration with appropriate MW at a later point in time but not less than 60 minutes from the window start time.

**Scenario 3:** If Service Providers want to change the default pricing or parameters which have been set up in the PAS system, there is no need to electronically re-declare prices. Service Providers can follow the existing means of contacting the relevant account manager with more than a weeks' notice.

**Note:** Kindly connect with PAS Support Team ([box.support.pas@nationalgrid.com](mailto:box.support.pas@nationalgrid.com)) in case of any uncertainty related to the duration of Availability Windows

Following are the exceptions and the appropriate error responses that would be expected when the xml payload is sent by Service Provider to National Grid ESO:

### **XSD Rejections:**

1. If ServiceType is not from the list or missing value, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
2. If ContractID is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
3. If EndDateTime is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

4. If StartDateTime is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
5. If DateTimeStamp is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
6. If BreakPointforOffer1Bid1 is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

### Other Rejections:

7. If ContractID value differs to what has been set up in PAS application (or NULL value in the tag), National Grid ESO will send a non-200 Internal Server Error synchronous response back to the SP with the message 'Invalid ContactID'

### Error Codes:

8. If ContractID is not mapped to the appropriate ServiceType selected, National Grid ESO will send availability confirmation with the error code 'AS\_Error2'
9. If StartDateTime and EndDateTime is not matching to the availability window as per contract for firm or optional availability window, National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error3'
10. If EndDateTime is in the past, National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error4'
11. If there are any values in BreakPointforOffer1Bid1 (MW values) other than contracted MW in the contract data or '0' for firm window National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error6'.
12. If there are any values in Offer1\_AvailabiliyPrice (availability price) and the window is firm irrespective of time or an optional window with less than 60 minutes before its start time for Firm / Optional Contracts (Firm / Optional window), National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error7'
13. If the absolute difference between SP DateTimeStamp and National Grid ESO's current system time (in UTC) is greater than one minute National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error9'
14. If emergency redeclaration has a BreakPointforOffer1Bid1 other than zero or if a declaration or redeclaration (non-emergency declaration) is sent post gate-closure, National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error11'
15. If there are any values in OfferPriceforOffer1Bid1 (UtilisationPrice) after gate closure National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error30'
16. If the BreakPoint value for OfferBid\_Number 1 (MW values) is not 0 or between FR Minimum MWs (currently 25) and the framework MW and the value is not a whole number (Only applicable for Optional Windows), National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error31'

17. If the EndDateTime is not within the contract start and end date time National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error33'

**Deprecated:**

18. If there are any values in OfferPriceforOffer1Bid1 (utilisation price) and the window is firm irrespective of time or an optional with less than 1 week before its start time, National Grid ESO will send availability confirmation rejection with the error code 'AS\_Error5'

**Other Notes:**

19. It should be noted that the multiple error codes can be sent in the same 'Reason' tag.
20. If there are any values in OfferPriceforOfferXBidX except when X is 1, National Grid ESO will accept these values but will not be considered for any calculations.
21. If there is any value for PhysicalNotification, National Grid ESO will accept these values but will not be considered for any calculations.
22. If there are any values in OfferX\_AvailabilityPrice except when X is 1, National Grid ESO will accept these values but will not be considered for any calculations
23. If there are any values in BreakPointforOfferXBidX except when X is 1, National Grid ESO will accept these values but will not be considered for any calculations

## 3.4 Availability Confirmation Service

This web service is primarily used to validate the re-declaration data submitted by Service Provider. If any of the exceptions mentioned in section 3.3 occur, the availability confirmation will be 'REJECTED' with appropriate reason code as mentioned in section 3.3.

**XSD Rejections:**

1. If ServiceType is not from the list or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
2. If ContractID is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
3. If DateTimeStamp is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
4. If either StartDateTime or EndDateTime is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
5. If Confirmation is not from the list or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure

**Other Rejections:**

6. If ContractID is not valid, National Grid ESO expects SP to send backend error message 'Invalid ContractID'
7. If ContractID is not mapped to the appropriate ServiceType, National Grid ESO expects SP to send backend error message 'ContractID not matching to ServiceType'
8. If StartDateTime and EndDateTime is different to the window provided by SP, National Grid ESO expects SP to send backend error message 'Invalid StartDateTime and EndDateTime'

9. If the absolute difference between National Grid ESO DateTimeStamp and Service Provider's current system time (in UTC) is greater than 1 min, National Grid ESO expects SP to send backend error message 'Invalid DateTimeStamp'

Using availability confirmation web service, National Grid ESO can send error codes for different windows in a single availability confirmation payload. National Grid ESO can also send multiple error codes for a single availability window. These error codes will be separated by semicolons.

### Deprecated Error codes (for reference)

The below error has been deprecated, as it is believed to cause an unnecessary overhead on managing Error codes for providers. If this has already been developed there is no harm however is not recommended for future development.

10. If Reason is different to the rejection codes mentioned in the above section, National Grid ESO expects SP to send backend error message 'Invalid Reason'

## 3.5 Availability Nomination Service

As discussed in section 2, (Firm) Fast Reserve contracts will have firm and optional windows whereas Optional Fast Reserve contracts will only have optional windows. The availability nomination service is used only for the optional windows for both the (Firm) Fast Reserve Contract as well as Optional Fast Reserve Contract.

In this web service the ServiceType tag defines the availability window rather than the contract i.e. even if the contract is 'Firm' Fast Reserve, National Grid ESO would have ServiceType as 'OPT\_FAST\_RESERVE'.

National Grid ESO will be sending the nomination against all the adjacent optional windows for which MW is non-zero and has the same value irrespective if the ContractID may belong to 'Firm' Fast Reserve or Optional Fast Reserve contract.

If StartDateTime value is sent in the nomination web service, National Grid ESO would like to arm / request the optional window to start from that time onwards. This will facilitate National Grid ESO to send dispatch instruction after it receives nomination confirmation acceptance from the Service Provider. The StartDateTime will always be 2 minutes after the current time and National Grid ESO will be able to send a dispatch instruction only after 2 minutes of sending this payload and post receiving the confirmation from Service Provider.

If EndDateTime value is sent in the nomination web service, National Grid ESO would like to disarm the optional window. This will be sent by National Grid ESO when the optional window is about to end leading to an adjacent firm window, when the next optional window is unavailable, there is a change in MW value of next optional window or manually by the control room user.

Optional windows can be disarmed in the situations only when the contract has not been dispatched or has been ceased. The EndDateTime should always be 5 minutes after the current time.

With the above rules in place and also within an optional window, National Grid ESO can send StartDateTime and EndDateTime multiple times in that order.

A minimum nomination time is the minimum amount of time between a nomination StartDateTime (for arm request) and EndDateTime (for disarm request). For example if a Service Provider has a minimum nomination time of 5 minutes and National Grid ESO sends an arm message to the Service Provider at 10:30 that message would have a StartTime of 10:32. The earliest National Grid ESO can send a message to disarm is at 10:35 where the EndTime will be 10:37.

In the example of an optional contract where there are adjoining optional windows with changing MW values, If National Grid ESO has armed in the first optional window, National Grid ESO will send disarm before it reaches

the end of the first window and will send another nomination to arm the second window. If the MW doesn't change for continuous optional windows, the arming would continue either until the window is unavailable or there is no declaration from Service Provider or there is a firm window.

When a SP has sent an emergency redeclaration for an optional window where it have been armed, National Grid ESO will not send a disarm to the SP for that nomination but will internally mark the end time of the disarm to that of datetimestamp of emergency redec received.

Nomination and Reason tags are not relevant to Fast Reserve Ancillary Service and will be omitted while sending the payload to Service Provider i.e. no such tags will appear in the payload for Fast Reserve.

#### **XSD Rejections:**

1. If ServiceType is not from the list or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
2. If ContractID is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
3. If NUI is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
4. If DateTimeStamp is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure

#### **Other Rejections:**

5. If StartDateTime is not in the future, National Grid ESO expects SP to send backend error message 'StartDateTime is not in the future'
6. If ContractID is not mapped to the appropriate ServiceType, National Grid ESO expects SP to send backend error message 'ContractID not matching to ServiceType'
7. If EndDateTime is not in the future, National Grid ESO expects SP to send backend error message 'EndDateTime is not in the future'
8. If ContractID is not valid, National Grid ESO expects SP to send backend error message 'Invalid ContractID'
9. If the absolute difference between National Grid ESO's DateTimeStamp and Service Provider's current system time (in UTC) is greater than 1 min, National Grid ESO expects SP to send backend error message 'Invalid DateTimeStamp'

### **3.6 Availability Nomination Confirmation Service**

This web service should be used by Service Provider to confirm the an arming nomination sent by National Grid ESO for optional window.

Service Provide may provide a reason in case they are rejecting the nomination.

#### **XSD Rejections:**

1. If ServiceType is not from the list or missing value, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
2. If ContractID is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

3. If NUI is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
4. If Confirmation is not from the list (ACCEPTED or REJECTED) or missing value, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
5. If DateTimeStamp is missing in the xml, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

#### Other Rejections:

6. If ContractID is not matching to the nomination payload National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message 'Invalid ContractID' in the response
7. If NUI is not matching to the nomination payload National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message 'Invalid NUI' in the response
8. If StartDateTime or EndDateTime is in the past (SLA breach), National Grid ESO will reject the confirmation with a backend error message 'SLA Breach' in the response
9. If the absolute difference between Service Provider DateTimeStamp and National Grid ESO's current system is greater than 1 min, National Grid ESO will reject the confirmation with backend error message 'Invalid DateTimeStamp' in the response
10. If StartDateTime or EndDateTime does not match the values National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message 'Invalid StartDateTime' or 'Invalid EndDateTime' in response

### 3.7 Dispatch/Cease Service

VolumeRequested is mandatory only for dispatch instruction. However, National Grid ESO will also send this value in Cease instruction. VolumeRequested will always be MW value for the window which you are in.

National Grid ESO will not send '0' MW dispatch instructions.

The same DUI is used for both Dispatch and Cease instruction. At any point in time, there will be only one active DUI per ContractID.

Dispatch instruction will have 'START' and cease instruction will have 'STOP' in the Instruction tag.

Instructions can be sent multiple times in sequence – START and STOP. As per the contract, the utilisation limits (Max MWhrs in an operational day (23:00 to 23:00 the next day – all in local time), Max Occurrence in an operational day, Max MWhrs per Settlement Period, Max Occurrence per Settlement Period, Max MWhrs per Service Period (period which has been tendered by service provider), Max Occurrence per Service Period, Max MWhrs per Service Term (contract term), Max Occurrence per Service Term) for dispatching energy will be applicable only for firm windows.

The cease instruction can be sent by National Grid ESO once the contracts have honored their Minimum Non-Zero Time (MNZT), which includes ramping up and ramping down period of the respective contract.

Below are some examples across various scenarios where the exact time after which National Grid ESO can send a cease instruction (i.e., **Ceaseable Time (CT)**) :-

[Note: Queries on the actual calculations of ceaseable time, they can be addressed by sending an email to [box.support.pas@nationalgrid.com](mailto:box.support.pas@nationalgrid.com)]

**Example 1:** MNZT = 0.

Suppose, Instruction sent at 10:00, Dispatched MW = 100, Response Time = 2 mins.

Therefore, instruction will become ceaseable at the end of Response Time, i.e., at 10:02.

**Example 2:** MNZT < Ramp Up Period [where, **Ramp up period** = Dispatched MW / Ramp up rate]

Suppose, Instruction sent at 10:00, Dispatched MW = 100, MNZT = 1 mins, RUR = 50, RDR = 50, Response Time = 2. [where **RUR**: Ramp up rate and **RDR**: Ramp down rate]

Therefore, as per calculations, CT = 0.5. Hence, the instruction will become ceaseable 0.5 mins past 10:02:00 (Dispatch time + Response Time) and when MW is 25.

**Example 3:** MNZT >= Ramp Up Period AND Ramp up period > (MNZT – Ramp Down Period) [where, **Ramp down period** = Dispatched MW / Ramp down rate]

Suppose, Instruction sent at 10:00, Dispatched MW = 100, MNZT = 3 mins, RUR = 50, RDR = 50, Response Time = 2.

Therefore, as per calculations, CT = 1.5. Hence, the instruction will become ceaseable 1.5 mins past 10:02:00 (Dispatch time + Response Time) and when MW is 75.

**Example 4:** MNZT >= Ramp up period AND Ramp up period <= (MNZT – Ramp down period)

Suppose, Instruction sent at 10:00, Dispatched MW = 90, MNZT = 7 mins, RUR = 39, RDR = 39, Response Time = 2.

Therefore, as per calculations, CT = 4.7. Hence, the instruction will become ceaseable 4.7 mins (i.e., 4 mins. 42 seconds) past 10:02:00 (Dispatch time + Response Time) and when MW is at full load.

National Grid ESO will have provision for emergency cease where it will send the cease instruction before minimum non-zero time is past. The DUI will have an 'E-' to indicate it is an emergency cease.

In the circumstances when Service Provider sends emergency redeclaration and the contract is dispatched, National Grid ESO will send cease instruction and it is deemed that the contract is auto ceased. irrespective of whether the contract has past the minimum non-zero time. It is assumed that a unit will not continue running after a service provider has initiated an emergency redec during dispatch. National Grid ESO will expect the Service Provider to send a cease confirmation back.

## **XSD Rejections:**

1. If ServiceType is not from the list or missing value, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
2. If DUI is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
3. If ContractID is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
4. If Instruction is different to that of XSD or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
5. If DateTimeStamp is missing in the xml, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure

## **Error Codes:**

6. ContractID is not valid, National Grid ESO expects SP to send Dispatch / Cease confirmation rejection with the error code 'DCS\_Error1'
7. If VolumeRequested is different to the MW value of the current window, National Grid ESO expects SP to send Dispatch / Cease confirmation rejection with the error code 'DCS\_Error2'
8. If the absolute difference between National Grid ESO's DateTimeStamp and Service Provider's current system time (in UTC) is greater than 1 min, National Grid ESO expects SP to send Dispatch / Cease confirmation rejection with the error code 'DCS\_Error3'
9. If ContractID is not matching to that of ServiceType, National Grid ESO expects SP to send Dispatch / Cease confirmation rejection with the error code 'DCS\_Error4'

In the situation where National Grid ESO did not get a 200 ok response back when the instruction has been sent, National Grid ESO may trigger a manual process to investigate the reason for non-response.

Upon receiving an 'error' response during a dispatch or cease instruction, concerned unit(s) will be marked unavailable (will be auto-disarmed as well for optional contracts) in ASDP.

The unit will be marked available again after the cause of receiving an 'error' response has been analysed by the ASDP Support Team.

## 3.8 Dispatch / Cease Confirmation Service

If National Grid ESO did not get a confirmation (after receiving a 200 ok response to the dispatch instruction that has been sent by National Grid ESO) past 10 seconds from the dispatch instruction, it will be deemed that the Service Provider is not available to dispatch at that point in time the contract will be made unavailable till the end of that particular availability window.

If National Grid ESO did not get a confirmation (after receiving a 200 ok response to the cease instruction that has been sent by National Grid ESO) past 10 seconds from the cease instruction, it will be deemed that the Service Provider has ceased the contract.

The same DUI should be sent for both Dispatch and Cease instructions. At any point in time, there will be only one active DUI per ContractID.

### XSD Rejections:

1. If the ResponseCode is different to that of XSD, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

### Other Rejections:

2. If Instruction (START or STOP) is not matching to the dispatch/cease xml payload National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message "Unexpected 'STOP' instruction type received" when START is sent in dispatch/cease instruction or "Unexpected 'START' instruction type received" message when STOP is sent in dispatch/cease instruction
3. If ContractID is not matching to the dispatch/cease xml payload National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message 'Invalid ContractID' in the response
4. If ErrorCode is different to that of the list mentioned in section 3.6, National Grid ESO will reject the confirmation with backend error message 'Invalid ErrorCode' in the response
5. If the absolute difference between Service Provider DateTimeStamp and National Grid ESO's current system time (in UTC) is greater than 1 min, National Grid ESO will reject the confirmation with backend error message 'Invalid DateTimeStamp' in the response



6. If DUI is not matching to the dispatch/cease xml payload National Grid ESO has sent, National Grid ESO will reject the confirmation with backend error message 'Invalid DUI' in the response
7. If Dispatch / Cease confirmation is received after 10 seconds, National Grid ESO will reject the confirmation with backend error message 'SLA breach' in the response.

## 3.9 Realtime Metering Service

National Grid ESO expects to get meter readings once every 15 seconds (at 00:00:00, 00:00:15, 00:00:30 and 00:00:45) in every minute.

National Grid ESO expects SPs to provide the average meter reading between the time (e.g. at 00:00:15, take the average of all meter readings between 00:00:00 and 00:00:15)

One meter read should be provided per contract. Sum of all the meter reads attached to the contract should be provided in the meter read. RTM payload should be received by National Grid ESO within 10 sec from the time it is sent from Service Provider.

As RTM is used by National Grid ESO to gauge the heartbeat of Service Provider's comms, we would consider the contract to be unavailable to dispatch, if

### Error Codes:

1. National Grid ESO does not receive any RTM in the last 2 minutes (i.e. 8 for Fast Reserve and Opt Fast Reserve), RTM NACK will be sent with an error code 'RTM\_Error1'
2. the values of DateTimeOfMeterReading received in the last 2 minutes are all duplicate, RTM NACK will be sent with an error code 'RTM\_Error2'
3. The values of DateTimeStamp received in the last 2 minutes are all duplicate, RTM NACK will be sent with an error code 'RTM\_Error3'

The other exceptions are handled as follows. Until the point National Grid ESO gets a valid RTM back, the contract will be unavailable as per the above mentioned logic.

### XSD Rejections:

1. If ServiceType is not from the list or missing value, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
2. If ContractID is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
3. If DateTimeOfMeterReading is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

### Other Rejections:

4. If ContractID is not mapped to the appropriate ServiceType selected, National Grid ESO will reject the RTM with backend error message 'ContractID not matching to ServiceType' in the response
5. If ContractID value differs to what has been set up in PAS application, National Grid ESO will reject the RTM with backend error message 'Invalid ContractID' in the response
6. If the absolute difference between DateTimeOfMeterReading and DateTimeStamp is greater than 30 sec, National Grid ESO will reject the RTM with backend error message 'Invalid DateTimeOfMeterReading' in the response

7. If MeterReading is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
8. If DateTimeStamp is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
9. If the absolute difference between Service Provider DateTimeStamp and National Grid ESO's current system time (in UTC) is greater than 1 min, National Grid ESO will reject the RTM with backend error message 'Invalid DateTimeStamp' in the response
10. If DateTimeOfMeterReading is not at 00:00:00, 00:00:15, 00:00:30 or 00:00:45 in every minute, National Grid ESO will reject the RTM with 'DateTimeOfMeterReading is not in 15 seconds' in the response
11. If DateTimeOfMeterReading is after the contract end date, National Grid ESO will reject the RTM with backend error message 'DateTimeOfMeterReading is after Contract end date' in the response

## 3.10 Realtime Metering Negative Acknowledgement Service

### XSD Rejections:

1. If ServiceType is not from the list or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
2. ContractID is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
3. If ContractID does not match to that of ServiceType, National Grid ESO expects SP to send backend error message 'ContractID not matching to ServiceType' in the response
4. If StartDateTime or EndDateTime is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
5. If DateTimeStamp is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure

### Other Responses:

6. If ContractID is not valid, National Grid ESO expects SP to send backend error message 'Invalid ContractID' If the absolute difference between National Grid ESO DateTimeStamp and Service Provider current system time (in UTC) is greater than 1 min, National Grid ESO expects SP to send backend error message 'Invalid DateTimeStamp'

### Deprecated:

The below error has been deprecated, as it is believe to cause an unnecassry overhead on managing Error codes for providers. If this has already been developed there is no harm however is not recommended for future development.

1. If ErrorCode not in the list as mentioned in section 3.8, National Grid ESO expects SP to send backend error message 'Invalid ErrorCode'

## 3.11 Settlement Metering Service

The settlement meter reads should be submitted for the previous operational day starting from D-2 23:00:00 (local time) to D-1 day 22:59:00 (local time) by 07:00 (local time) on the current (D) day. For example, on 07 April 2018 at 07:00, National Grid ESO would expect the SPs to submit the meter reads between 23:00:00 on 05 April 2018 to 22:59:00 on 06 April 2018. So, National Grid ESO would expect to see 1440 meter reads every normal day.

Moreover, National Grid ESO expects the settlement meter reads to be submitted by the Service Provide, for a particular contract, after it has started its service term and thereafter should continue sending the meter reads, as per above mentioned rule. For example, if a particular contract is starting its service term from 23:00:00 on 01 April 2021, National Grid ESO would expect the settlement meter reads for the new contract from 03 April 2021 onwards, i.e., by 03 April 2021 at 07:00, the service provider should submit the meter reads for the mentioned contract between 23:00:00 on 01 April 2021 to 22:59:00 on 02 April 2021 and so on.

The meter read should be the average read in a minute. For example, the meter read on 04:30:00 should be the average of meter reads from 04:29:00 to 04:30:00.

Each meter reading should be submitted in a separate meter reading window tag.

#### **XSD Rejections:**

1. If ServiceType is not from the list or missing value, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
2. If ContractID is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
3. If DateTimeOfMeterReading is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.
4. If DateTimeStamp is missing, National Grid ESO Middleware rejects the same via XSD validation and SP should be getting a 500 Internal Server Error response back. The response will also provide the details of the error.

#### **Other Responses:**

5. If ContractID value differs to what has been set up in PAS application, National Grid ESO will reject the payload with bad request 'Invalid ContractID' in the response

#### **Error Code Responses:**

6. If ContractID is not mapped to the appropriate ServiceType selected, National Grid ESO will send a rejection in the settlement metering confirmation with 'SS\_Error2' in the reason field
7. If any DateTimeOfMeterReading is after the contract end date, National Grid ESO will send a rejection in the settlement metering confirmation with 'SS\_Error4' in the reason field
8. If the absolute difference between SP DateTimeStamp and National Grid ESO's current system time (in UTC) is greater than one minute National Grid ESO will send settlementconfirmation rejection with the error code 'SS\_Error5'
9. If MeterReading is missing, National Grid ESO will send a Rejection in the Settlement Metering Confirmation with 'SS\_Error6' in the reason field
10. If an unspecified error occurs , National Grid ESO will send a Rejection in the Settlement Metering Confirmation with 'SS\_Error99' in the reason field

There will be manual data validations which are not part of this document.

### 3.12 Settlement Metering Confirmation Service

The purpose of this web service is to provide an asynchronous response to the Settlement metering submissions. Service providers will receive a Settlement Confirmation message after submitting Settlement metering. This will have an 'ACCEPTED' meaning the submission was valid or 'REJECTED' meaning one of the errors mentioned above happened.

In case of multiple errors, the reason will be given separately .

**XSD Rejections:**

1. If ServiceType is not from the list or missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
2. If ContractID is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure
3. If Confirmation is missing or different to the enumerated values, National Grid ESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure
4. If DateTimeStamp is missing, National Grid ESO expects SP to throw 500 Internal Server Error as XSD validation failure

**Other Responses:**

5. If the absolute difference between National Grid ESO DateTimeStamp and Service Provider current system time is greater than 1 min, National Grid ESO expects SP to send backend error message 'Invalid DateTimeStamp'
6. If ContractID is not valid, National Grid ESO expects SP to send backend error message 'Invalid ContractID'

## 4 Window Crossover

### 4.1 Known Scenarios currently not covered in ASDP

**Crossing from Firm into Optional Window:**

When Instruction is ran from a Firm window into an optional ASDP will not send an arming instruction. We are seeking further clarification from the contracts team how to proceed.



Following the cease above in the optional window, providers should wait for an arm nomination when needed from the ENCC. NB Settlements will be made aware of 'missing' nomination in the example above.

## 5 Security rules and exceptions

As of Technical Specifications v4.0, National Grid ESO is expecting all the webservices to be authenticated with usernames and passwords. Each Service Provider will have one set of username and password pair i.e. if Service Provider has multiple contracts across any ancillary service types, National Grid ESO will provide a single pair of username and password across all contract ids. If SP sends incorrect username and password or if there is a combination mismatch to the username password to that of contract id in the web services, National Grid ESO will send the appropriate error (will be only 500 error code when sending backend error exception and for XSD validation failure). It is expected for SPs to send the same to National Grid ESO.

## 6 Previous Changes

This section is used to show previous changes to help understand the previous major changes without looking through every version of the BLD.

### 6.1 2019 OCP FR Changes:

From time to time the Fast Reserve contracts between Service Providers and National Grid ESO are being amended to upgrade the service. The changes mentioned below are only those which will affect the way in which PAS functions or how Service Providers' systems relevant to PAS will be impacted.

The go-live date of the change is specified as 25<sup>th</sup> March 2019

Changes:

- 1) Change of Operational day from 05:00 – 05:00 to 23:00 - 23:00 (local time)
- 2) Change in the time when nomination gets armed or disarmed - from 5 minutes to 2 minutes. This means when National Grid ESO sends a nomination arm request the start time will be in 2 minutes time. Including when a disarm message is sent the end time of the nomination message will be in 2 minutes time.
- 3) Introduction of a minimum nomination time. This is a contract parameter which once specified will act as a minimum time for which the contract will be nominated for as per the definition in section 3.5
- 4) Introduction of dynamic price changes to optional windows through web services given a weeks notice as described in section 3.3

Potential Impacts to Service Providers:

**Change one:** The main functionality currently tied to operational day is the max usages per operational day i.e. when a utilisation limit for either MWH or count is reached. From National Grid ESO side, once the unit has reached or exceed a utilisation limit for the Operation day post cease instruction, it will be marked as unavailable for dispatch until the next operational day.

If a service provider has hard coded any utilisation limits in their system with operational day then this change will impact their system. If operational day is configurable or not used then no change is required.

**Change two:** The only way this will impact service providers is if they have implemented any functionality which requires the arm time to be around 5 minutes in the future or have an operation issue with arming and disarming in 2 minutes.

**Change three:** It is not recommended that anything is developed for minimum nomination time in the Service Providers systems. In the event if Service Provider wants to build validation on their side, they could use error code 99 or email the support box if any issues are faced during minimum nomination time.

**Change four:** The change had been implemented as to provide no impact to Service Providers in the current availability setup. Further detail is included in the availability section. If a Service Provider does not wish to implement this functionality they are able to send the changes in prices for optional through current process given a weeks notice.

## 7 Appendix

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