Static Firm Frequency Response Guidance Document

Version 1 – July 2026



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Version History

Version	Added Information	Date Published
V0	N/A	N/A
V1	1. Updated to NESO format 2. Merge old ESO guidance (ppt) for onboarding and auctions with NESO guidance (word doc) for data requirements and performance monitoring 3. Include new sections for Summary, Service specifications, Auctions, Performance Monitoring & Settlement	June 2026

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Static FFR Summary

The information in this guidance is tailored to support Static Firm Frequency Response (SFFR) providers during service delivery. This Provider Guidance is designed to provide information to new, existing and transitioning providers of the SFFR Service.

This document complements the service's contractual documents: the latest Service Terms and Procurement Rules were approved by Ofgem on 22 May 2026. In the event of any conflict or inconsistency between this document and the contractual documents, the latter shall prevail.

The **Static Firm Frequency Response (SFFR) service** makes up part of the NESO's suite of Response Services. Together these services work to control system frequency through pre and post fault conditions keeping the frequency within our licence obligations around 50Hz. SFFR provides post fault delivery when system frequency passes below a "trigger point" of 49.65Hz. When frequency reaches this trigger point the contracted SFFR units must ramp to their contracted output within 30 seconds and continue delivering at this contracted output until the end of the Maximum Response Period.

This guidance is published to support the onboarding to the new terms by existing and potential SFFR providers, as well as providing additional information on participation in SFFR auctions.

This document will be updated outside of the Response Reform annual development cycle to allow for more frequent updates.

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Service Specification



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Technical Parameters

Design Element	Detail
Direction	Positive
Minimum Contract Size	0.1 MW
Provider eligibility	Non-BM & BM units
Contract window	EFA block
Time to full delivery	Up to 30 seconds from frequency trigger breach
Maximum Response Period	30 minutes
Energy Requirement	Unit must be able to deliver the full 30 minutes at any contracted point
Operational Metering	Currently not required
Dispatch mechanism	Frequency trigger breach – Currently set at 49.65Hz

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Technical Parameters

Design Element	Detail
Notice to start ramping	0 minutes
Ramp rates	No maximum ramp up rates. Minimum ramp-up to be line with time to full delivery.
Performance metering	1Hz at the unit level
Performance monitoring	Delivery check following a frequency trigger event Monthly spot availability checks
Baselining	Active power measurement when the frequency dropped below trigger value
Aggregation	Allowed, nationally
Operational data requirements	N/A currently
Passing through zero	Allowed
Cross-overs	Units expected to deliver full 30 minutes once triggered during a contracted period, including delivery into subsequent EFA blocks. Only exception being if unit was moving onto a Dx contract.

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Joining the Service



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Pre auction preparation

Prior to participating in SFFR auctions providers will need to complete the following actions.

SFFR tender submission provider details spreadsheet.

The SFFR tender submission provider details spreadsheet needs to be submitted by the provider prior to first bid submission for the auctions. Once you have submitted the SFFR Tender submission provider details spreadsheet for the SFFR auctions you will not need to submit this again unless you are making any amendments such as adding new units, changing tested MWs and any change of email addresses.

Note: The SFFR Tender submission provider details spreadsheet is used for the validation of tender submitted via the dedicated .box. Please note that information provided in SMP and in the Tender submission must exactly match, this includes formatting matches such as capitalisations and spacing.

Single market Platfom (SMP) registration

Providers are required to register themselves along with units and assets on SMP and sign up to the contractual terms. The details registered on the Single Market Platform will be those used to set up the Auction with prequalified Units, this information will include MW capacity and Unit ID.

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Single Markets Platform (SMP) - Onboarding

Prior to participating in frequency services all assets will need onboard using the Single Markets Platform.

The Single Markets Platform is a portal that aims to provide frictionless access to ESO markets through APIs which support the onboarding process for ESO markets.

To participate in the SFFR daily auctions providers must be registered on SMP. SMP allows the provider to register all the assets used top provide the service and allocate them either singularly or aggregated to a Unit ID, to aid with this API functionality for bulk uploading of large asset portfolios for is available for providers. SMP has Docusign to allow digital signing of the contractual documents.

SMP registration for SFFR consists of the following:

- Provider registration
- Unit registration / asset details
- Uploading documentation e.g. testing reports
- Signing up to the SFFR contractual terms

Comprehensive guidance on how to use the SMP and API bulk uploading of assets can be found on the ESO website.

- SMP User Guide
- SMP API Detailed User Guide

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First Time User Registration

If you and your organisation are new to NESO and the SMP Portal, you must register directly via the portal using the following instructions.

The User should visit and bookmark the following link: https://portal.nationalenergyso.com/smp/s/login/

As a first-time user you will need to click the "Register New Account" button. Users will be navigated to the first 'screen' to capture Registration.

Registering New Primary User

In order to access the SMP Portal, it is expected that upon initial registration the main or 'primary' contact (user) at your organisation/company will undertake the registration steps.

Registration involves submitting one's contact details and their organisation/company details. The successive order is contact details followed by company details.

When entering email addresses or telephone numbers, standardised formats are expected, if a User/Contact does not submit field values compatible with the expected format then the field will be flagged in a red border with a prompt instruction. For example, if an email address has been submitted with the incorrect format.

Once all of the fields have been completed on the User/Contact section, the "Next" button will no longer be shaded grey, instead it will be converted into a blue 'button', allowing you to proceed to the next step.

Registering the Primary User's Company

The 'Register new Account' stage involves two pathways depending on the Company Status. If the User/Contact's organisation is a UK Limited Company, they select the first checkbox. If the User/Contact's organisation is a non-UK Company then they select the second checkbox.

Once the option is selected, the user clicks on the "Next" Button.

Registering a UK Company

The User/Contact will be prompted to search for the Company Name and the Company Registration Number.

For Company Name - they will be expected to enter the name, which will trigger a lookup search/listing of similar names for the user to choose from.

For Company Registration Number - they will be expected to enter the exact reference number, which will trigger a lookup search/listing for the user to select and confirm.

Please note that only valid and accurate Registration Numbers will be accepted and appear in the search exercise. If your Company is a UK Limited Company and the search listing is unsuccessful, you will need to reach out to your NESO Account Manager by email

Once a match has been found, the User/Contact must select the "Submit" button to proceed to the next step.

If the search result is incorrect or the User/Contact wishes to undertake a new search, then they are expected to click on the "Remove Company" link to refresh the search functionality.

Once the search result is correct, then the User/Contact selects the "Submit" button on the bottom right-hand corner of the screen.

For more information on this process, or for information on registering a non-UK company click here.

For technical support please contact: commercial.operation@nationalenergyso.com

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Unit and Asset Registration

Once you have registered as a user on SMP, you can begin creating your units and assets you wish to prequalify for Quick Reserve.

In order to do so, you should enter your SMP account via the following link: https://portal.nationalenergyso.com/smp/s/login/

If you are a first-time user, please follow the guidance on the prior slide to register yourself/your company.

If not, or you have already completed first time user registration, you can proceed to register your Units and Assets in SMP and pre-qualify them for SFFR.

For users who already have Assets and Units in SMP, for other services (i.e, DC/DM/DR, Balancing Reserve), that you wish to pre-qualify for SFFR, you can move ahead to **Pre-qualifying Units for SFFR.**

Registering New Assets and Units

You can register new Assets and Units on the SMP portal, by following the instructions in the demo video linked here: Creating Assets and Units in SMP

or by following the instructions in **Section 4 and 5** of the SMP External User Guide

This process is the same as for any other services you have pre-qualified for in SMP; such as DC, DM, DR and Balancing Reserve.

Prequalifying Units for SFFR

In order to prequalify your units for SFFR, you should have created your Assets and Units, and linked them together (As per the prior video and section 6 of the User Guide). You can then proceed to pre-qualification, by following the instructions in the demo video linked here (ensure you have selected the relevant Quick Reserve service): Prequalifying Units for Balancing Services

Or by following the instructions in **Section 7** of the SMP External User Guide

Once you have submitted your unit/s for pre-qualification, they will be reviewed by the NESO team. We will check that: a signed Form B has been provided, as well as that the Unit information is correct and meets the service parameters. If all of this is true, your unit will be approved and is ready to take part in Quick Reserve.

Please note that all company information must match what is listed on Companies House

For technical support, and SMP queries, please contact: commercial.operation@neso.energy

A failure to submit valid MPAN information will result in pre-qualification approval being delayed/withdrawn.

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User Journey

Stage	Explore	Onboarding	Participate	Contract Management	Dispatch	Review	Payment
User Journey	Gather data and information Build business case Understand codes, markets and connections Understand Service Parameters	User, company, unit asset registration, MPAN registration Pre-qualification Agent set up Contract Accession Asset / Unit versioning User Management	Auction Submission	Contracts awards and status Manage contracts	Automated based on frequency trigger level	Data collection / submission	Performance monitoring Settlement Disputes Financial position
NESO Systems	NESO Website	Single Markets Platform	Email	Data Portal		Email	Settlement System

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Testing requirements

Prior to participating in frequency services all assets will need to have passed the pre-qualification testing found in the SFFR testing guidance.

All assets seeking to pre-qualify as Eligible Assets will be required to pass testing prior to pre-qualification except as provided in the Registration and Pre-Qualification Procedure of the Procurement Rules.

Testing will be the responsibility of the Registered Static FFR Participant and subject as provided below should be undertaken/verified by an Independent Technical Expert (ITE). Testing is required at 1Hz.

NESO will require an ITE approval report as part of any submission of an Eligible Asset (or collection of Eligible Assets as the case may be) for pre-qualification. The report shall be deemed accepted by NESO once submitted. However, should any queries be raised, the Eligible Asset (or collection of Eligible Assets) shall not be capable of being allocated to a Static FFR Unit for participation in the daily auctions until any queries have been satisfied.

Testing shall also be required before the Registered Quantity of an existing Eligible Asset (or collection of Eligible Assets) can be increased.

All example graphs in this document are for illustrative purposes only.

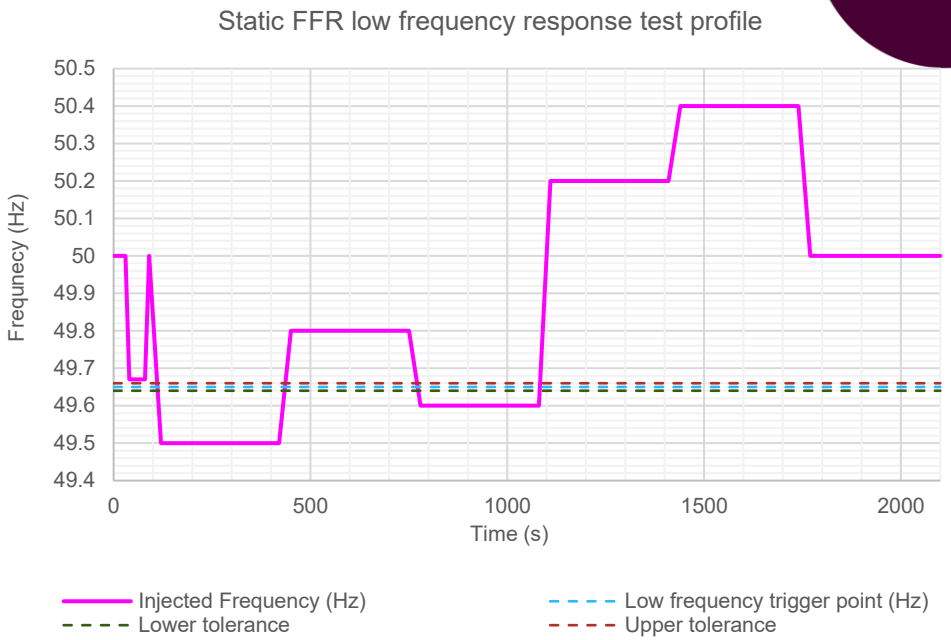
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Testing requirements

Frequency injection profile

The non-dynamic low frequency test is designed to assess the capability of the Registered Static FFR Participant to deliver Static FFR from the relevant Eligible Asset (or collection of Eligible Assets) as described above.

The frequency profile can be injected either at site or remotely to the device that will be measuring frequency to trigger a response. The minimum sample rate for the Test is 1Hz.



Time (s)	Injected Frequency (Hz)
0	50
30	50
40	49.67
80	49.67
90	50
120	49.5
420	49.5
450	49.8
750	49.8
780	49.6
1080	49.6
1110	50.2
1410	50.2
1440	50.4
1740	50.4
1770	50
2010	50
2100	50

The injected frequency profile used in testing is shown above and where the trigger frequency is 49.65Hz. Testing is to be completed at the prevailing trigger level (as detailed in the Procurement Rules defined terms) at the time of registration. The trigger level may be updated by NESO from time to time, meaning assets must have the capability to alter the trigger frequency on each eligible asset.

The initial frequency dip to 49.67Hz aims to prove that the relay will not activate (hence no response) if the frequency drops to just above 49.65Hz. During the sweep from 50Hz to 49.5Hz, the Relay should trigger at 49.65Hz (±0.01Hz). Once the Relay has triggered, full response should be reached within 30 seconds and be sustained for a further 1770 seconds (30 minutes after relay trigger) regardless of the varying frequency injection.

Testing requirements

Pass criteria, limits of error & minimum sample rates

The limits of error and minimum sample rates for testing are shown for Static FFR. All success criteria are subject to the stated limit of error/accuracy threshold.

Pass criteria

- An acceptable frequency injection profile is used (See above).
- The Relay (or equivalent) activates at the correct contracted trigger frequency and within the permitted tolerance (±0.01Hz).
- Sustain the response for the 30 minutes. Response volume is assessed as the minimum response observed from 30 seconds to 30 minutes following relay trigger.
- The standard deviation of active power error over a 30-minute period must not exceed 2.5% of the contracted active power change. (Standard deviation is calculated from 30 seconds to 30 minutes following relay trigger).

	Limit of error/ Accuracy threshold	Minimum Sample rate
Frequency (Hz)	±0.01 Hz	1Hz
Active Power (MW)	Please see pass criteria below	1Hz

Testing requirements

Aggregation

The options for the live test are as follows.

1. A single asset capable of meeting the Static FFR service specification on its own.
2. A collection of ‘new’ assets capable of meeting the Static FFR service specification can be tested simultaneously. These could then contract as a standalone Response Unit or be added to an existing Response Unit.

Where the Eligible Asset being tested is made up of more than one item of Plant and Apparatus, the test described above can be carried out as follows.

1. Each item of Plant and Apparatus is asset tested and assessed separately with the minimum test volume being added to the Eligible Asset. This approach can also be used when adding new items of Plant and Apparatus to an existing Eligible Asset.
2. Test carried out on each item of Plant and Apparatus is time stamped then results aggregated for assessment.
3. Test all item of Plant and Apparatus within the Eligible Asset simultaneously.

Testing requirements

Independent Technical Expert: Definitions

Test results for Static FFR will be assessed by an Independent Technical Expert (ITE) who will prepare a Test Certificate (Test Certificate template can be found in Appendix 1).

The following definitions shall apply:

- Group means, for any person, another person who is the direct or indirect Holding Company of that person and any Subsidiary of that Holding Company.
- Holding Company means, in relation to a company, any other company in respect of which it is a Subsidiary.
- Independent Technical Expert means an experienced technical expert with expertise in the operation of demand side Static FFR (DSR) or generating units or electricity interconnectors (as the case may be), Independent of the prospective Service Provider, engaged by the prospective Service Provider at its expense to carry out a technical assessment and prepare a Test Certificate.
- Independent means, for any technical expert and the applicable prospective Service Provider, that the technical expert is:
    a) not in the same Group as the prospective Service Provider; and
    b) neither engaged on terms, nor party to any other arrangements, which could allow the prospective Service Provider or any member of its Group to exercise undue influence on any assessment of the Test Certificate prepared by that technical expert or otherwise compromise the objectivity of any such assessment and test certificate to the Required Technical Standard.
- Required Technical Standard means, with respect to any assessment and Test Certificate prepared by an Independent Technical Expert that:
    a) to the best of the Independent Technical Expert's knowledge and belief all information provided in it is accurate, complete and not misleading; and
    b) any opinions or forecasts in the assessment have been conservatively prepared on assumptions which it considers to be fair and reasonable.
- Subsidiary means a subsidiary within the meaning of section 1159 of the Companies Act 2006 (but relation to an Interconnector, or shareholder in such provider, subsection (1)(a) of that section shall apply as if a "majority of the voting rights" included 50% only of those rights)
- Test Certificate means a certificate in the relevant form set out in Appendix 1 prepared by an Independent Technical Expert.

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Auctions



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Auction Overview

Design	SFFR auction
Services Auctioned	SFFR is a standalone auction run independently of Dynamic Response and Reserve auctions.
Auction Frequency	The SFFR auctions will be **run daily at 11:30**, the **Auction Gate Closure is 11:00**. Any bids submitted after 11:00 will be rejected for that days auction.
Auction Design	**Auction type:** Closed double-sided auction, pay-as-clear auction. **Objective function:** Maximisation of social welfare. **Pricing:** Uniform clearing price per product for each service window. **Locational granularity:** GB synchronous area. **Overholding** allowed (cleared quantity may exceed NESO bid quantity). **Procurement:** Capacity (MW).

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Auction Overview

Design	Static FFR
Auction Timing	
Gate Opening	08:00 BST/GMT D-14
Gate Closure	11:00 BST/GMT D-1
Publication of Results on Data Portal	By 17:00 BST/GMT D-1 (although NESO will aim to publish soon as practible after the auction)
Sell Order Design	
Number of Baskets per Unit per Delivery day	6 (1 per EFA)
Number of Parent Orders per Basket	1
Number of Child Orders per Basket	Not permitted
Number of Substitutable Child Orders per Basket	Not permitted
Technical Parameters	
Technical Minimum Prices (£/MW/h)	0.01
Technical Maximum Prices (£/MW/h)	999.99
Minimum Contract Size (MW)	0.1

Note: "D" stands for "delivery date".

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Volume Requirement

The requirement is published on Data Portal which will specify what SFFR we are aiming to procure.

You will find the link to the dataset on Data Portal here:

Static Firm Frequency Response Requirement | National Energy System Operator

The data will be refreshed daily typically.

The requirement is per service window.

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Order Submission Process

The following section will give a step-by-step guide to submitting orders. If you and your organisation are new to NESO and have yet to register to SMP, then it is required that you register there first.

Providers are required to send their bids to the specified .box (see bid submissions section for details), providers can submit bids up to 14 days in advance whilst retaining the option to resubmit bids up to gate closure on the day of the auction.

All bids must use the correct SFFR bid submission file and format (csv). Bids received in the incorrect file type and/or format will be rejected and will require resubmission.

Submitted bids will receive a rejection notification if the bid file is rejected with information on why the bid has failed to be processed. Providers will then have the opportunity to amend and resubmit ahead of gate closure. Bids submitted very close to gate closure may not leave sufficient time to act on any rejection notification and resubmit an amended bid.

Providers wishing to withdraw bids should change the MW volume to Zero (0) and resubmit the SFFR bid submission file, this will not affect other previously submitted bids from the same file that are not to be withdrawn.

Bids are submitted on a £/MW/Hr basis and providers can only submit one bid per EFA block for each unit. To be able to bid a unit into all 6 EFA blocks you will need to submit 6 bids in the Tender submission file identifying which EFA block the bid relates to in column H (EFA). Bids spanning multiple EFA blocks are not permitted in the SFFR auction.

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Bid submissions

Please be advised that all providers are required to send their bids to box.sffrbidsubmission@neso.energy

The email should contain a .csv attachment and the subject line must read “SFFR Auction Bid Submission"

- The bid submission tool will conduct a validation process of the .csv file. Once this process has been completed, an automated response will typically be sent within 5-7 minutes (may vary depending on file size), indicating whether the file has been accepted or rejected
- It is important to keep in mind that the file may be rejected for various reasons, which will be highlighted in subsequent slides
- Please check that any additional lines at the bottom of the csv file have been removed. Notepad++ can be used for this
- Please send the SFFR Tender submission provider details spreadsheet prior to bid submission. Failure to do this will result in the csv file failing validation
- **NOTE :** The aforementioned email address and subject line must be strictly adhered to in order to receive an automated response

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CSV specification

- To ensure compliance with the submission requirements, please be advised that the .csv file must comprise 8 columns in the following order: Auction_Day, Auction_Month, Auction_Year, Unit, Provider, Volume, Price, EFA. It is essential that the columns are in the same order as demonstrated in the example .csv file.
    - Please note that the auction day is the date of the auction and not the day of service delivery, e.g. for an auction being run on the 21st March submission the auction date is 21
- The data types for each column are detailed in the table in the next slide to facilitate accurate and consistent data submission. Please ensure that the data types for each column align with the specifications outlined in the tables to avoid the possibility of rejection during the validation process.

Example screenshot of the bid submission template

A	B	C	D	E	F	G	H
Auction_Day	Auction_Month	Auction_Year	Unit	Provider	Volume	Price	EFA
28	2	2023	ABC-1	ABC Energy	9	70	1
28	2	2023	ABC-1	ABC Energy	5.25	80	6
28	2	2023	ABC-1	ABC Energy	8	90	5

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CSV specification

Columns	Data type	Minimum or min length	Maximum or max length
Auction_Day	Integer	1	31
Auction_Month	Integer	1	12
Auction_Year	Integer	2026	-
Unit	String	5	10
Provider	String	5	50
Volume	Float	0.1 (0 if the bid needs to be withdrawn)	-
Price	Float	0.01	-
EFA	Integer	1	6

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Error codes

Case	Overview	Automated response	Error message
1	Incorrect subject line	No response expected	**N/A**
2	No attachment	No attachment found	**There is either no attachment with your email or the attachment is in an unsupported format. Please recheck and add your bid submissions in .csv format**
3	Attachment that is not a CSV	Invalid attachment found	**No valid file found. Please upload the correct file type (CSV)**
4	Invalid dates. For example : 32/03/2023	Dates submitted are not valid	**[{"Validation Error":"Integer 32 exceeds maximum value of 31.","Value":32,"Column":"[0].Auction_Day"}]**
5	£0 bids submitted	Bid Price submitted is not valid	**[{"Validation Error":"Float 0.0 is less than minimum value of 0.01.","Value":0.0,"Column":"[0].Price"}]**
6	Invalid EFA blocks. For example : 7	EFA blocks are invalid	**[{"Validation Error":"Integer 7 exceeds maximum value of 6.","Value":7,"Column":"[0].EFA"}]**
7	No blank fields (null values)	Null values found	**The file has null/blank values and/or a blank row at the end of the file, please review and resubmit**

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Error codes

Case	Overview	Automated response	Error message
8	Email address not registered to unit	Email used for Bid submission is not valid	**Email address "email address" is not permitted to submit bids for "Unit ID"**
9	UTF-BOM formatted file	Invalid file type	**One or more of the files submitted is encoded as UTF-8-BOM please encode as UTF-8 and resubmit**
10	Unit ID is not registered	Email used for Bid submission is not valid	**"Unit ID" is not a registered unit**
11	Bid volume exceeds capacity	List of bids where the volume bid exceeds registered	**Volume submitted for "Unit ID" is greater than the registered volume. Also, the details in the error message will point to which row it is**
12	Bid submitted too soon (prior to auction opening time)	List of bids where the bid is invalid	**The date submitted is not for an open auction. Also, the details in the error message will point to which row it is**
13	Bid submitted too late (post auction closing time)	List of bids where the bid is invalid	**The date submitted is not for an open auction. Also, the details in the error message will point to which row it is**

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Data requirements



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Performance Metering

All files must be submitted at 1Hz granularity by no later than 5 days after a request from NESO (SFFR service terms - 15.9)

SFFR Performance Metering Requirement:

- DateTime
- Frequency (Hz) – 3 d.p.
- Active power (MW) – 3 d.p.

All providers (both BM and non-BM) are required to submit data to NESO for post-event performance monitoring. This data is required by NESO to validate the performance where units are contracted for SFFR, both when the service has trigger and when it hasn't.

DateTime (BST)	Frequency (Hz)	Metered Power (MW)
2025-07-25 11:00:00	49.934	8.211
2025-07-25 11:00:01	49.945	7.794
2025-07-25 11:00:02	49.947	7.544
2025-07-25 11:00:03	49.956	7.500
2025-07-25 11:00:04	49.960	8.064
2025-07-25 11:00:05	49.963	8.446
2025-07-25 11:00:06	49.963	8.517
2025-07-25 11:00:07	49.957	8.480
2025-07-25 11:00:08	49.955	8.836
2025-07-25 11:00:09	49.953	9.842

Following an event or a request for performance monitoring data, NESO will email the market participant a template for the submission of performance monitoring data. It is critical that performance monitoring data is submitted using the template provided with the following considerations:

1. Do not amend file names
2. Excel tab name must be UNIT ID only and must be identical to the UNIT ID submitted into the auction
3. Delivered power must be in MW
4. MW delivered through demand reduction must be inputted as a negative value e.g. -1.203

This file must be sent as a reply to the email that sent the template within 5 working days of the request from NESO.

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Performance metering

Active power

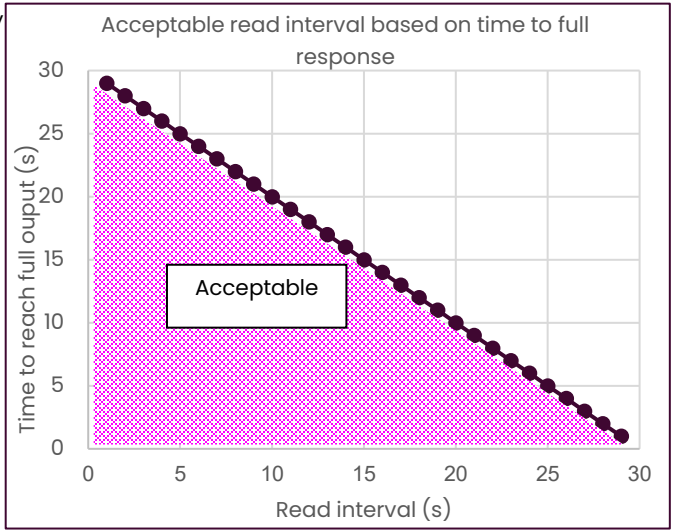
Providers are required to measure active power at 1Hz at the unit level.

For units that are wishing to aggregate assets that don't currently meet the minimum unit threshold, providers can utilise sites that they are unable to get measurements at 1Hz granularity if they please.

As the service and testing process require Eligible Assets to respond within 30 seconds of a frequency trigger, measurements from assets must be at a more regular frequency than this. Providers are allowed to use their own discretion around the read frequency that is adequate to show delivery of a service from an eligible asset. This will be driven by how quickly assets are able to achieve full output following a frequency trigger.

Example 1 – If an asset takes up to 15 seconds to achieve full response following a frequency trigger, that asset will have to record measurements at a more regular occurrence than 15 seconds to be considered for an aggregated Static FFR unit

Example 2 – If an asset takes up to 25 seconds to respond to achieve full response following a frequency trigger, that asset will have to record measurements at a more regular occurrence than 5 seconds to take part in the service.



The required measurement frequency is therefore bound by the maximum time an asset could achieve full response following a frequency trigger. This needs to be maintained for all performance metering data, including those submitted for availability checks. It is expected that providers will be aggregating similar asset types that will therefore have comparable asset capacities, response times and measurement intervals. It is also assumed that assets not measuring every second will measure at set time interval that are uniformly distributed across the assets being aggregated e.g. If a unit contains 100 assets, all measuring at 5 second read frequency, NESO expects 20 assets each second to be recording new measurements into the aggregation.

All performance monitoring checks will be conducted on unit level data, which will be provided at 1 Hz granularity. The process for measuring performance remains unchanged, meaning the onus is on providers to ensure they can prove they have delivered the service through measured data at each site. The service terms provide for NESO to inspect measurement equipment/data on site at an Eligible Asset participating in Static FFR auction, which includes accessing data for each Eligible Asset that was used to create the data for an aggregated Static FFR unit.

Performance Metering

Active power – example

An example of how this requirement works in practice.

- Unit size – 200 kW (0.2 MW)
- Asset sizes – 20 kW (0.02 MW)
- Time to full response – 20 seconds
- Measurement interval – 5 seconds

Frequency passes trigger

Unit level data (provided to NESO)			Indivudal asset data (Not provided to NESO)									
DateTime	Frequency (Hz)	Unit metered power (MW)	Asset 1	Asset 2	Asset 3	Asset 4	Asset 5	Asset 6	Asset 7	Asset 8	Asset 9	Asset 10
2025-07-25 13:38:32	49.903	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:33	49.791	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:34	49.642	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:35	49.601	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:36	49.605	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:37	49.609	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:38	49.609	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:39	49.611	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:40	49.618	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:41	49.617	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:42	49.619	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:43	49.621	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:44	49.62	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:45	49.625	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:46	49.624	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:47	49.629	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:48	49.632	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:49	49.635	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:50	49.641	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:51	49.643	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:52	49.645	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:53	49.654	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:54	49.656	0	0	0	0	0	0	0	0	0	0	0
2025-07-25 13:38:55	49.662	0.04	0	0	0	0.02	0	0	0	0	0.02	0
2025-07-25 13:38:56	49.69	0.08	0	0	0	0.02	0.02	0	0	0	0.02	0.02
2025-07-25 13:38:57	49.692	0.12	0.02	0	0	0.02	0.02	0.02	0	0	0.02	0.02
2025-07-25 13:38:58	49.7	0.16	0.02	0.02	0	0.02	0.02	0.02	0.02	0	0.02	0.02
2025-07-25 13:38:59	49.703	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2025-07-25 13:39:00	49.663	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2025-07-25 13:39:01	49.685	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2025-07-25 13:39:02	49.698	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2025-07-25 13:39:03	49.701	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
2025-07-25 13:39:04	49.705	0.2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Recorded measurement on-site

Last known measurement used for aggregation

Assets reach full delivery

PM data shows full delivery

Max response time

We know from the data above that by 20 seconds after the frequency trigger, the unit will be delivering the full 0.2 MW. However, as the data isn't being recorded each second, this is only confirmed by the performance monitoring data 25 seconds after the trigger.

When aggregating measurements to provide a 1 Hz performance monitoring feed, providers should use the latest measurement taken from a site until a new active measurement is recorded.

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Performance metering

Frequency

Units are required to measure frequency at least at a 1Hz rate.

For units that are wishing to aggregate assets that don't currently meet the minimum unit threshold, it is acceptable for an eligible asset which is providing static FFR to be triggered remotely, using a frequency transducer located at some central location to detect frequency deviations in real time and incite a response from the site. Measurement points should be located on or as close to asset locations where possible.

Providers must notify NESO if they are taking this approach and provide the location of their frequency measurement. NESO will be actively monitoring this approach and may take the decision to require on-site frequency measurements and relays should there be any reason to believe delivery is detrimental to system frequency. Providers should consider any delay introduced in time to get to full delivery if using a centralised approach.

The intention is for the service to transition to locational aggregation, meaning frequency measurement data triggering a response will need to be within the same aggregation zone.

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Other data requirements

- **Declaration of availability/unavailability**
  - As soon as feasibly possible after becoming aware of inability to deliver the Static FFR service (in whole or in part), the service provider should notify the ENCC via telephone call to ensure they are aware of unavailability and necessary actions can be taken to procure additional response where needed. Following the telephone call with ENCC this declaration should be followed up with an email to commercial.operation@neso.energy.
  - As prescribed in the Service Terms should a provider wish to transfer this obligation to another eligible asset due to unavailability, the provider should discuss this with their account manager. The account manager will be able to communicate to the provider whether the request to transfer the obligation to another eligible asset has been approved or rejected.
- **Operational data** – No requirement currently
- **Operational metering/heartbeat** – No requirement currently
- **State of energy** – It is the sole responsibility of providers managing energy limited assets to ensure they can always deliver their contracted capacity during a contracted EFA period.
- **Stacking** – Currently splitting is permitted with the BM, additional details for how this is achieved is documented in the Response Stacking Guidance.

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Performance Monitoring



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Performance Monitoring

Performance monitoring checks will be performed on any unit that has been contracted for Static FFR. These checks are detailed in the service terms and assess a contract is met under two different scenarios.

Service delivery (following a frequency trigger) (15.6):

In the event of a frequency event occurring that drops below the defined frequency trigger level of the service, all units contracted for Static FFR will be expected to deliver their contracted capacity. Each contracted unit will be required to submit a performance monitoring file for the full contracted EFA (SFFR service terms – 15.1), for NESO to perform a service delivery check. If delivery was to roll into the subsequent period (i.e. delivery was triggered in the final 30 minutes of the service window), then providers are required to submit performance monitoring data for the additional period of delivery that exceeds the contracted service window (SFFR service terms 6.2).

Service availability (when a frequency trigger hasn't taken place) (15.3-5):

Separate to this, NESO will also request performance monitoring data each month from any unit that has received a Static FFR contract for the previous month. This request will be for a selected single EFA block of performance monitoring data for which the unit was contracted. NESO will perform the service availability check and if applicable, apply any performance monitoring deductions to the given contracted block. If the availability check results in a payment reduction (i.e. performance is below 95%), then NESO reserves the right to request data for more periods where the unit was contracted. This is to conduct further availability checks and if applicable, apply deductions to payments.

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Suspension/de-registration

If consistent under-performance is witnessed, NESO reserves the right to suspend or de-register units until better performance can be guaranteed by the provider.

If units are assessed to be underperforming for >50% of contracted periods in a given month, they will be considered for suspension unless valid reasoning is provided. Where units are demonstrating this level of performance it will trigger a conversation with the relevant Account Manager or NESO Service Lead to understand what the issues is and how it can be resolved.

If, after a further two months, NESO has not received evidence that the Static FFR participant has taken steps to improve performance, it may suspend and/or deregister the relevant unit. This may apply, among other circumstances, where there are delays in corrective action, failure to implement a resilient and robust process, aggravating behaviour, or failure to act promptly after becoming aware of the breach, either before or during NESO's investigation.

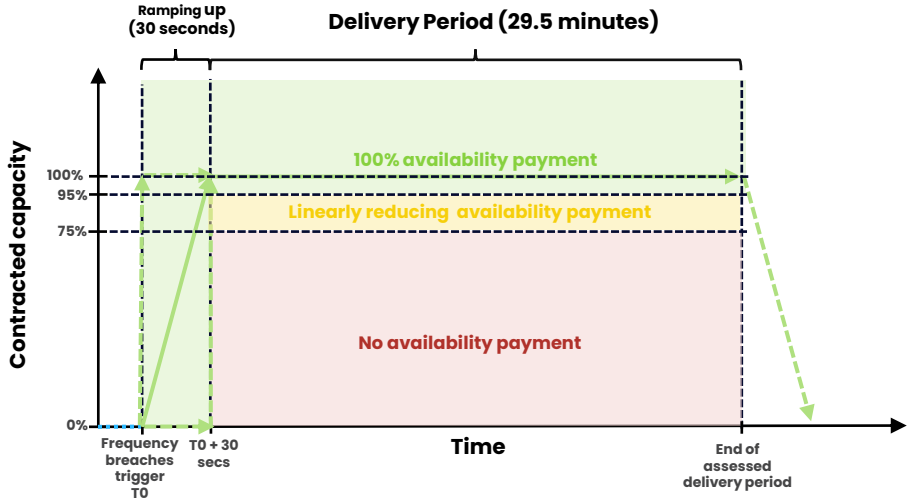
This method will ensure that continual breaches of the Service Terms and/or Procurement Rules are accounted for through appropriate performance management, while also ensuring that providers and units have time to rectify any issues prior to more severe penalties.

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Performance Monitoring

Delivery

This assesses that a contracted unit has delivered its contracted capacity in the event of a frequency excursion below the trigger frequency level. It calculates the difference between the output of the unit and a baseline, assessing this against the contracted capacity to derive a Percentage Performance Measure (PPM). It uses the minimum delivered output between 30 seconds after frequency drops below the trigger level, to 30 minutes after (i.e. the Delivery Period).



Percentage Performance Measure[1] = $\frac{Minimum\ delivered\ output}{Contracted\ capacity}$

Minimum delivered output

- **For generation/bi-directional units** = Baseline - Min(active power output in delivery period)
- **For demand side units only** = Baseline – Min(active power output in delivery period)

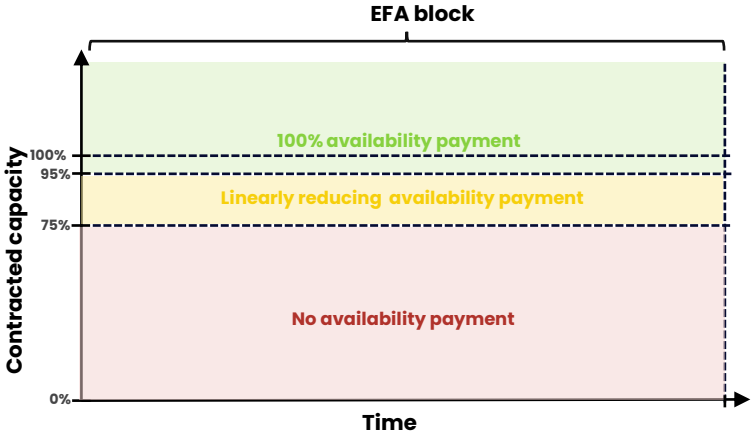
Baseline = Active power at T0

[1] Assessed over delivery period, applied to full contracted EFA

Performance Monitoring

Availability

This assesses that a contracted unit had the available capacity to deliver the service if it were to have been triggered. For demand units, it calculates a PPM based on the difference between the highest point in the demand profile (less a minimum baseline if one exists) and the contracted capacity. For generation units, it calculates a PPM based on the difference between the highest point in generation profile and maximum available output against the contracted capacity.



Percentage Performance Measure[1] = $\frac{Minimum\ available\ capacity}{Contracted\ capacity}$

Minimum available capacity

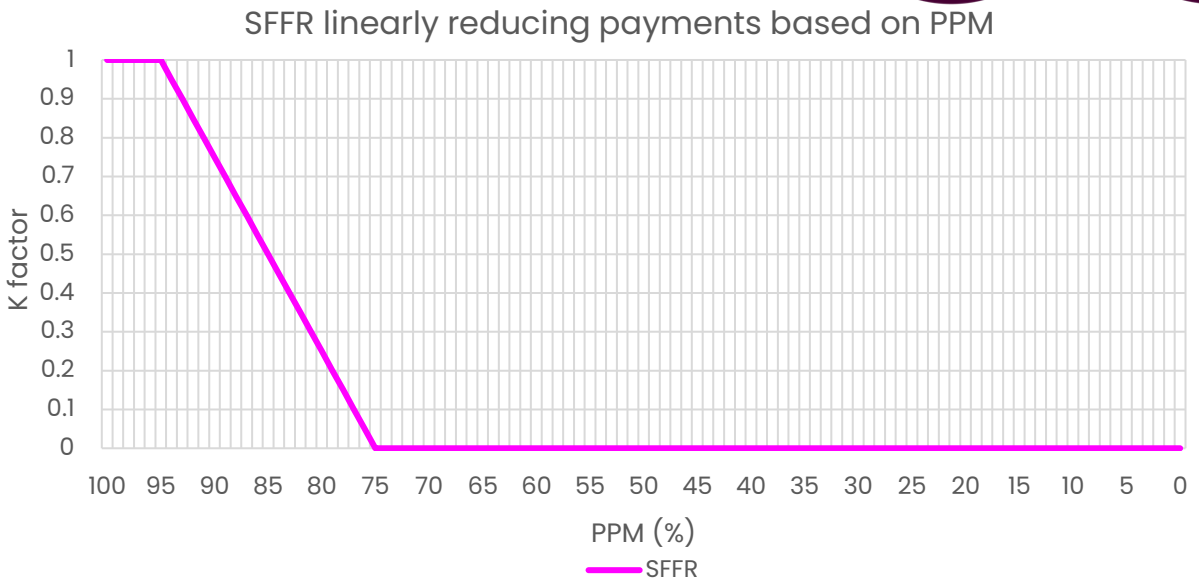
- **For generation/bi-directional units** = Maximum available output[2] - Max(active power output in EFA)
- **For demand side units only** = Minimum registered input[3] – Min(active power output in EFA)

[1] Assessed and applied over full contracted EFA.
[2] Assumed to be registered export capacity of unit, unless stated otherwise.
[3] Assumed to be 0, unless stated otherwise.

Performance Monitoring

Percentage Performance Measure

The PPM is used to derive a deduction in the availability payment for the relevant contracted EFA block. The PPM applies a linearly reducing reduction in availability payments for PPM's (as calculated on the previous slides) from 95% to 75%.



PPM	% by which Availability Payment is reduced	K factor (applied to final availability payment)
≥ 95%	0%	1
< 95% - ≥ 75%	1%-99% (reducing linearly)	0.99 – 0.01 (reducing linearly)
< 75%	100%	0

Performance Monitoring process

Example 1 – no service trigger across month

Service availability checks only

- **1a -** Selected contracted EFA block - EFA 6 on 14th day of month. As no performance penalties, no further data requested.
- **1b -** Selected contracted EFA block - EFA 6 on 14th day of month. Under performance resulting in penalties, therefore further data requested for 3 additional periods for further performance checks.

1a – No performance penalty

Day of Month \ EFA	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

1b – Performance penalty

Day of Month \ EFA	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
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30						

	Contracted period
	Uncontracted period
	Performance monitor check – Pass
	Performance monitor check – fail
★	Service triggered

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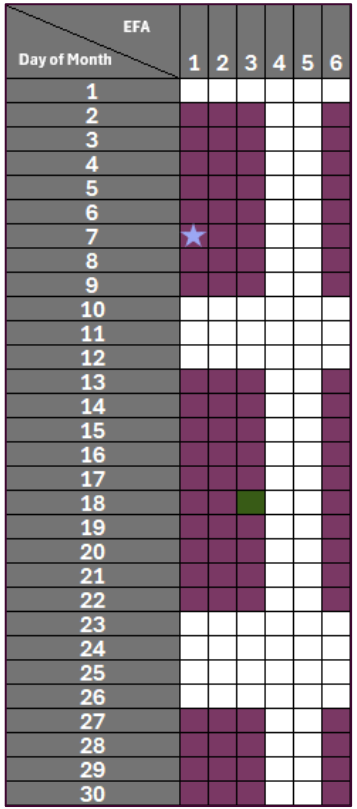
Performance Monitoring process

Example 2 – Service trigger across month

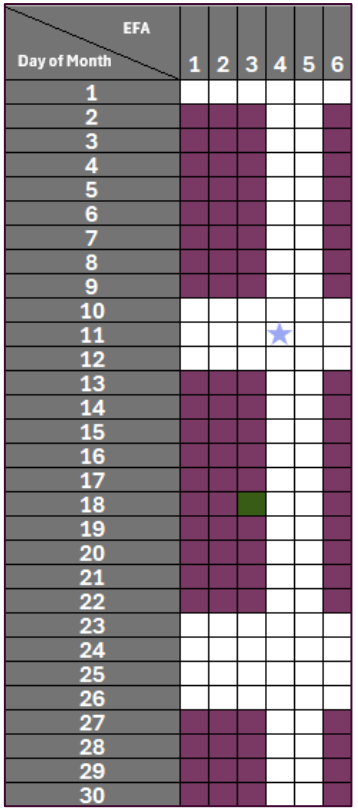
Delivery and availability checks:

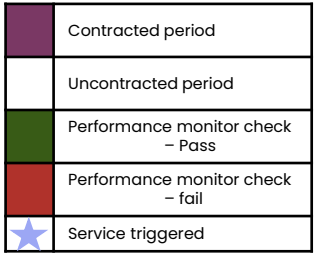
- **2a -** Service triggered in EFA 1 on 7th day of month, data requested for this period and service delivery check completed by NESO. Also, service availability check - Selected contracted EFA block – EFA 3 on 18th day of month. As no performance penalties, no further data requested.
- **2b -** Service triggered in EFA 4 of 11th day of month, no data requested for service delivery check. Service availability check - Selected contracted EFA block – EFA 3 on 18th day of month. As no performance penalties, no further data requested.

2a – Whilst contracted



2b – Not whilst contracted





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Performance Monitoring process

Requirements for crossover periods

In any given service window, units are required to deliver the full 30 minutes once delivery has been incited by frequency falling below the trigger level. Therefore, if a frequency event occurs in the final 30 minutes of a service window, this will include delivery into a subsequent window. This is detailed in the current service terms for Static FFR (6.2).

As current service windows are EFA blocks (4 hours), the likelihood of a frequency trigger event taking place in the final 30 minutes is relatively low. This, coupled with the low trigger rate of the service (expected to drop to a couple times per year with the new trigger level), means the likelihood of this event occurring is rare. However, we still see it prudent to detail NESO's expectation in these circumstances, to help inform providers how to configure their sites to respond in different circumstances.

- **If jumping onto another type of NESO service (not including Dynamic Response)** - Static delivery required to continue and will be assessed through performance monitoring. This includes if a unit isn't moving onto a dedicated NESO service but has other energy commitments (e.g. wholesale market commitments). There will be no penalisation based on performance of subsequent NESO services a unit has jumped in this circumstance.
- **If jumping onto a Dynamic Response contract** - Dx delivery should be prioritised, Static FFR delivery should cease at the service window boundary and Dx delivery for subsequent service window should deliver in line Dx service terms. Static FFR performance monitoring will only assess delivery in the contracted service window and not any future windows.
- **If jumping onto a new Static FFR contract (which may be for the same capacity or a different amount)** - Static delivery required to continue for the capacity contracted in the initial service window. Delivery assessed in performance monitoring against that original amount.

Providers should adhere to guidance around what their performance baseline should reflect if any delivery of a service impacts the baseline in the next service window.

For the avoidance of doubt, if a provider is moving into a period without any NESO contracts, delivery is to continue (and will be assessed) for the full 30 minutes from the trigger point.

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Settlement



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Availability Payments



Availability Payments

- The day ahead Static FFR auction is Pay-as-Clear.
- 6 4-hour service windows (EFA blocks), running 23:00-23:00 GMT.
- Market participants submit their availability prices and static FFR offered capacity before 11:00 Gate Closure time.
- NESO submits a buy order which represents the willingness to pay for a given volume of firm Static FFR capacity.
- A cohort of accepted sell orders and buy orders is determined to maximise market welfare.
- A clearing price is determined to maximise market welfare whilst minimising total cost of procurement.

All successful providers for each Service Window will be paid the clearing price for that Service Window (subject to contract compliance)

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Get in touch

Email us with your views on this guidance document:

box.futureofbalancingservices@neso.energy

And one of our team members will get in touch.

Access our current Static FFR documents here:

- Service terms
- Procurement rules
- Testing guidance
- Auction results
- Website main page

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