

Performance Monitoring of Balancing Services

Quarterly Update Report

October 2020



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Key Messages

- This is our first performance report, which will be updated on a quarterly basis moving forwards.
- Through proactive Performance monitoring, we continue to drive consumer value. Over the 3-month period between June to August 2020 we have recovered nearly £1.8m from committed contract spend.
- Working with service providers we continue to strive towards providing greater transparency of performance so that incremental improvements can be made for the benefit of the system and end consumers.

Introduction

Our [Roadmap](#) for Enhancements to Performance Monitoring of Balancing Services provides the industry with details on the actions we are taking to provide greater transparency over how we proactively monitor and manage performance of balancing services. Within the roadmap, we have committed to producing quarterly reports which will provide regular updates on the performance of our balancing services. By sharing data on performance, we hope to provide greater transparency around the performance of the contracts that we award.

We welcome feedback on this report. Should you have any questions or comments, please do not hesitate to contact us at commercial.operation@nationalgrideso.com

What's in this report

This is the first of these quarterly reports and covers the three-month period from June to August 2020. It is initially focused on Short Term Operating Reserve (STOR), Firm Frequency Response, Enhanced Frequency Response and Optional Downward Flexibility Management (ODFM), but over time our ambition is to expand the coverage to other services that we procure.

Progress against roadmap

Performance monitoring

For STOR we already have a well-established and automated performance tool to make sure we recover costs associated with under performance. We have now established bespoke reports to identify under-performance and Events of Default (EOD) at an individual unit level and a monthly process for proactive engagement with providers. We wrote out to a number of providers in September to follow up on underperformance to establish any root cause problems, and we are in the process of following this up with individual providers.

For Firm Frequency Response, we have proactively increased the frequency of performance monitoring that enables us to track performance and quickly identify any contracted FFR unit that has under-performed. This monthly performance monitoring helps build up performance trend analysis data which better enables us to contact providers regarding any performance issues and establish and underlying issue/s that resulted in a drop-in performance. The performance data makes sure that we recover any costs associated with underperformance along with any additional measures that we need to undertake, such as de-rating in future tender assessment and/or retesting of underperforming units.

Optional Downward Flexibility Management (ODFM) is a time limited service that was introduced to support the lower levels of national demand associated with the COVID-19 national lockdown. Due to the time constraints of implementing the service, performance metrics are simpler than other services. However, we have been reviewing the performance of all contracted units and their utilisation, recovering payments for non-delivery. Within this report, we have provided a performance summary for the whole summer from the product.

Dynamic Containment (DC) underwent its soft launch on 1st October 2020. Performance monitoring has been an integral part of the design of this product, with automation and data review a key element. Both BM and non-BM parties are able to send 20Hz metering granularity through a web based application to allow timely monitoring.

Short Term Operating Reserve (STOR)

STOR allows us to have extra power in reserve for when we need it. It helps us meet extra demand at certain times of the day or if there's an unexpected drop in generation. We award firm STOR contracts to providers on a Committed or Flexible basis across six annual seasons. Non-Balancing Mechanism (NBM) providers can also offer their assets (where eligible) on the day via the Optional STOR service.

What we pay providers

Availability – Paid (£/MW/Hr) for the hours in which the committed firm service has been made available.

Utilisation payments – Applicable to firm and Optional service. Paid £/MWh for the energy delivered.

Performance measures

We have a fully automated monitoring system of contracted STOR delivery, based on the following key measures:

- A minimum of 90% of the contracted MWs must be delivered for each instruction and across each STOR season a minimum 95% must be delivered in aggregate for all instructions. Across the STOR year, a unit must be available for at least 85% of the Settlement Periods in its contracted windows.

Where a unit triggers an Event of Default (EOD), a service failure in either availability or delivery, it will not receive payment for most or all of the relevant Availability Window. In addition to no payment for EOD, a further penalty of up to 30% of the monthly availability payment will be deducted. The following links highlight the full list of [BM](#) and [NBM](#) EODs.

Performance reports for June to August 2020

Availability Windows

In the reporting period, covering STOR Seasons 14:2 and 14:3, there were committed STOR Availability Windows across a total of **178,445** half hourly settlement periods (SP) provided by a total of **92 STOR units**. Of the **36%** of windows where units were unavailable, a total of **£584,241** of availability payments were withheld. The 36% comprises of units that held a flexible STOR contract, those that declared themselves unavailable, and those triggering an Event of Default (EOD). Please note that under flexible STOR, service providers offer their units for Availability Windows but the ESO can reject. These rejections are included within the 36% but will be separated out for the next reporting period for greater transparency.

Table 1 Statistics for STOR Seasons 14:2 and 14:3

Total Settlement Periods (SP)	178,445
Total SP where units available	114,740
Total SP where units unavailable/rejected	63,705
% unavailable/rejected	36%
Total Events of Default (EOD)	17

Table 2 STOR Seasons 14:2 and 14:3 EOD's

Total Events of Default (EOD)	17
Number of providers with EOD	6
EOD code 'LATE'	9
EOD code 'IANU'	6
EOD code 'CDEL'	2

Utilisation

For the Firm (BM/NBM) service there were a total of 8 instructions in the reporting period with 5 achieving the required 90% performance - See figure 1 for breakdown of performance. For the Optional (NBM) service there were a total of 58 instructions (54 in June) with 33 achieving the required 90% - see figure 2. The automated monitoring of contract performance payment withheld payment of ~ **£11k** where actual energy delivered was less than the expected energy delivered.

Figure 1 Firm service performance breakdown

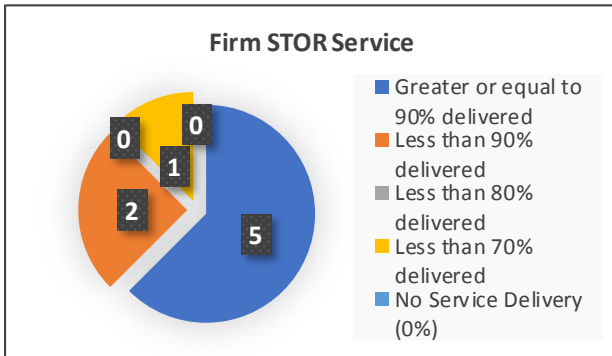
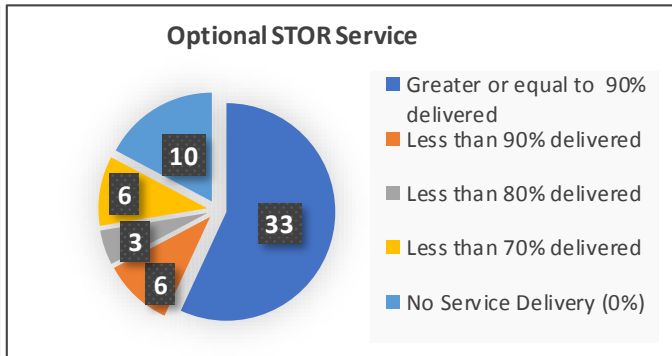


Figure 2 Optional service performance breakdown



Firm Frequency Response

Firm Frequency Response is a service we use to keep the system frequency close to 50Hz. Fast acting generation and demand services are held in readiness to manage any fluctuation in the system frequency, which could be caused by a sudden loss of generation or demand. There are three types of frequency response known as “primary”, “secondary” and “high”. The difference between primary and secondary is the speed at which they act to recover the system frequency. Both primary and secondary react to low frequency conditions, and high response reacts to high system frequency conditions, restoring the frequency to normal operational limits.

What we pay providers

FFR service is paid an availability fee on a £/Hr basis to providers for the MW and hours in which the firm service has been Contracted through the monthly tender. There is no utilisation payment for the FFR service.

Performance measures

We have a process for the monitoring of contracted FFR delivery on a monthly basis. Performance monitoring is conducted on a sample period which is selected by the ESO, this period is normally where a frequency excursion either above or below 50Hz has occurred. The Percentage Performance score from this sample period will then have the following key performance factors applied:

Table 3 key performance factors

Percentage Under Delivery	Performance Factor
<10%	100%
>10%<60%	50%
>60%<95%	25%
>95%	0%

Where a units performance triggers a performance factor regarding the delivery of the service, it will receive a reduced payment for that months contracted availability fee. Where a unit persistently under performs, other measures can be taken by us to address this along with any reduced availability payment. These include retesting of the Unit and applying a de-rating factor to future tender assessments.

Performance reports for June to August 2020

In the reporting period, covering delivery from FFR tenders TR125 (June), 126 (July) and 127 (August) there was a total of 71 units contracted to deliver Frequency response over the period of June to August 2020. For this period, there was a total of **£6.2m paid for the availability** to deliver the FFR service. Over the three months the performance of **Units averaged at 98% delivery** resulting in us looking to recover circa **£20k for under performance** for the same period. A breakdown of these figures can be seen in the charts below.

Figure 3 Performance Monitoring June - August

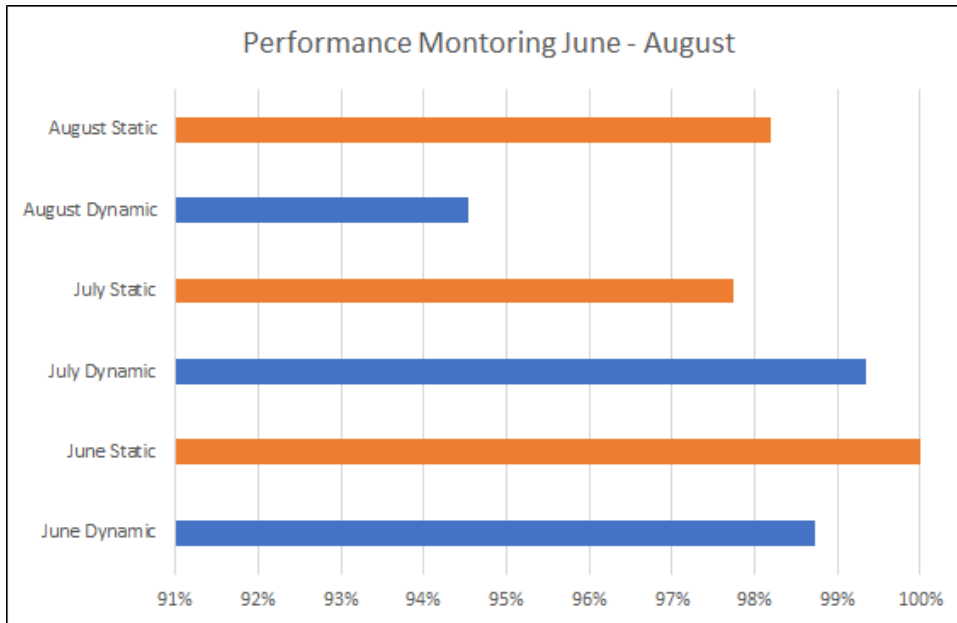


Figure 4 FFR TR125-127 Tendered costs £/K

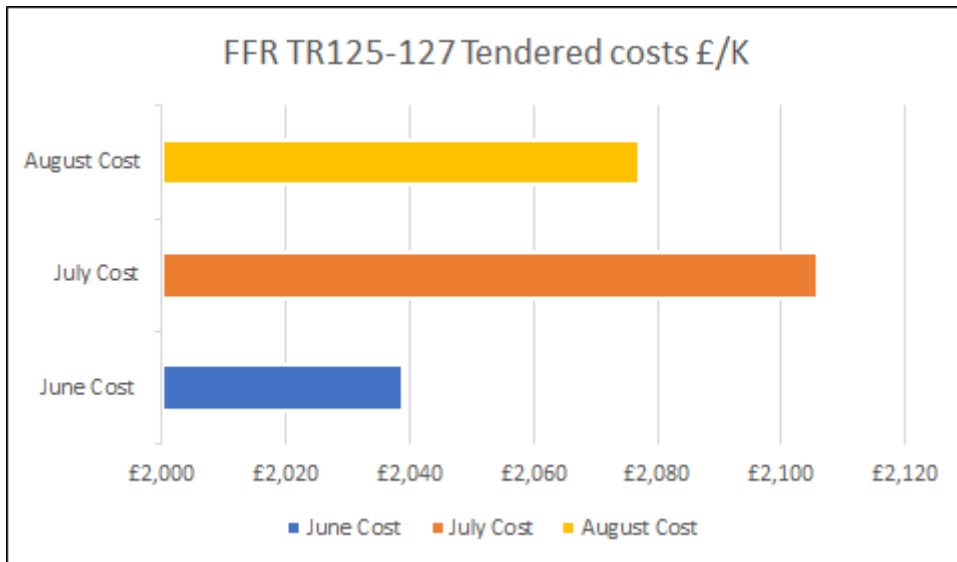
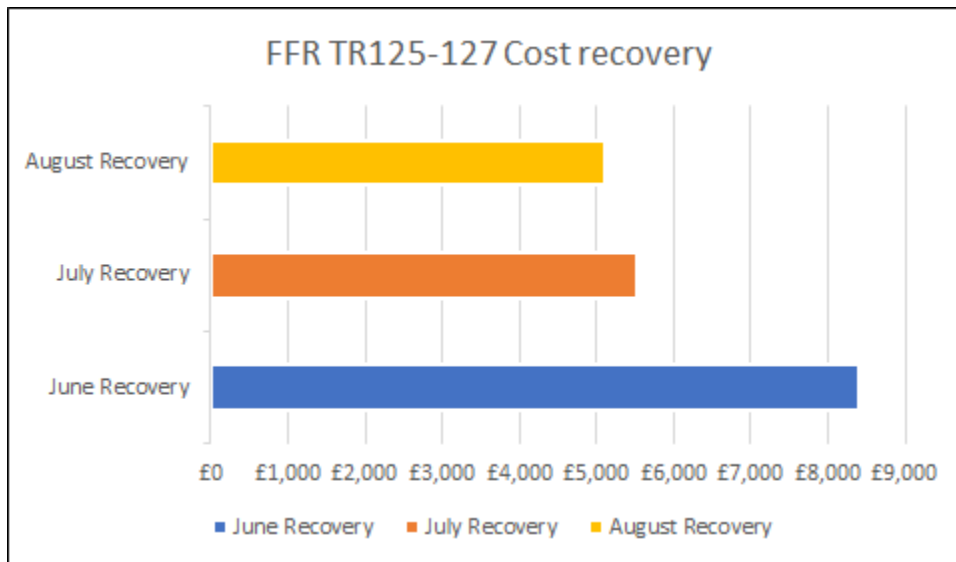


Figure 5 FFR TR125-127 Cost recovery



Enhanced Frequency Response (EFR)

Enhanced Frequency Response is a service we use to keep the system frequency close to 50Hz. EFR is a Faster acting generation and demand services than FFR and like FFR is held in readiness to manage any fluctuations in the system frequency, which could be caused by a sudden loss of generation or demand.

What we pay providers

EFR service is paid availability on a £/Hr basis to providers for the MW in which they have been contracted to provide. There is no utilisation payment for the EFR service.

Performance measures

EFR availability is automatically monitored through declared unavailability. Availability payments are reduced according to the declared unavailability during the monthly period. Providers who have encountered high periods of unavailability are contacted and if persistent then additional measures can be taken.

Performance reports for June to August 2020

In the reporting period, covering delivery from EFR Contracts during June – August 2020 there was a total of 10 units contracted to deliver EFR. For this period, there was a total of **£5.6m paid for the availability** to deliver the EFR service. During this reporting period, there was an **average availability of 93%**. Over the reporting period this resulted circa **£375K of availability payments not being paid to providers**. A breakdown of these figures can be seen in the charts below. For reference the reduction shown in availability for the month of August was down to a combination of planned Network outages and Asset maintenance across several EFR providers.

Figure 6 EFR Unit Availability June-August

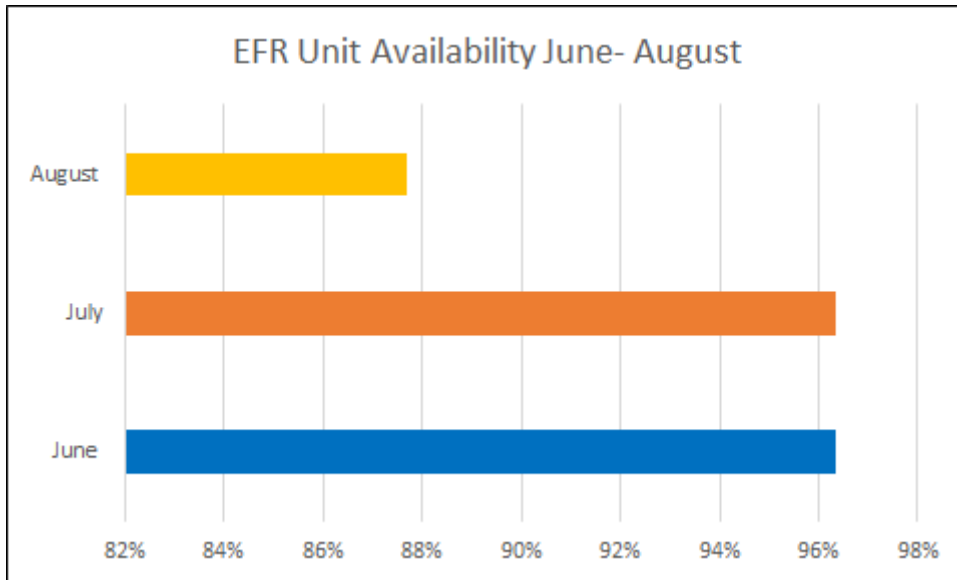


Figure 7 EFR Availability Paid £/K

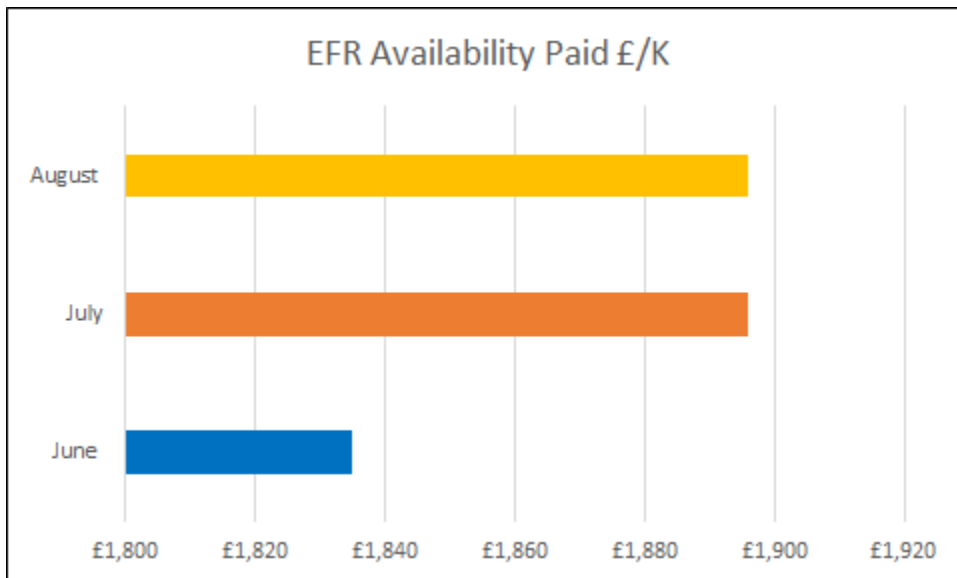


Figure 8 EFR Recovered costs from declared unavailability



Optional Downward Flexibility Management (ODFM)

When demand is low, there may be a requirement for additional flexibility to balance generation and demand, as well as to achieve sufficient negative reserve and high frequency response. Restrictions associated with COVID-19 presented lower demand periods for longer durations this summer than we have seen in the past. To help manage these changing system conditions NGENSO implemented the Optional Downward Flexibility Management (ODFM) Service.

ODFM is a service which allows us to access downward flexibility that is not currently accessible in real time and expand our ability to control output from providers we cannot currently access through the Balancing Mechanism and the Platform for Ancillary Services.

What we pay providers

ODFM is an instructed service at day ahead stage and there is no availability payment. Participants are only paid when the service is instructed. The Service Fee is a £/MW/h service fee that is submitted by the provider and applied to the entire instructed period for the full registered service volume of the response unit.

Performance measures

The rapid implementation of ODFM was undertaken in a compressed time period to meet the Summer operability challenges that Covid presented. As a result, we have developed a set of performance measures that were simple for parties to understand, to maximise early adoption of the service. Given the limited timescales for introducing the service, there was minimal IT development opportunities. All ODFM performance monitoring is therefore conducted offline with some tool automation to help review the large volumes of data.

Following the ODFM consultation, participants have a 10% tolerance for delivery and if they fall outside this no payment is made for the instruction. This reflects the importance of delivery under the ODFM service as it is a commercial tool ahead of emergency disconnection.

The majority of participating assets had never participated in ESO balancing services before under ODFM and as a result the provider onboarding and performance review process was particularly challenging as the majority of the assets had no prior experience of participating in such services.

Performance Overview

We have utilised ODFM 5 times since it went live over the first May bank holiday weekend. These instructions played a crucial part in supporting the control room to manage the low demands which were associated with the national lockdown and COVID-19 pandemic.

We had just over 4.7GW of assets registered under the service, spread across 362 units, from 54 registered providers.

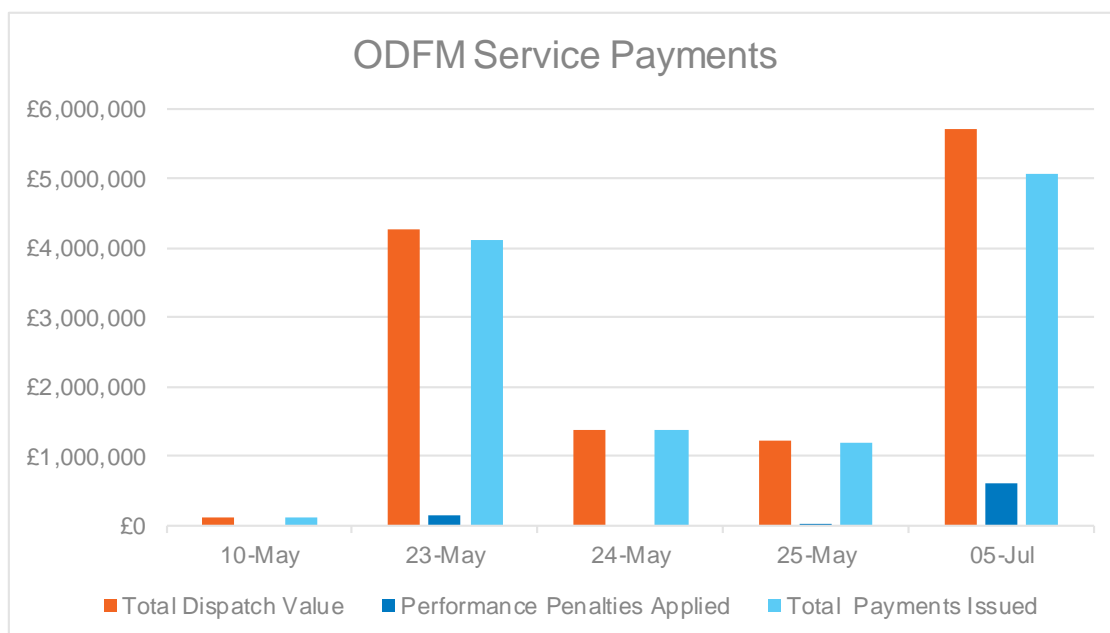
This report looks at performance, from the start of May and the introduction of the service. For the five instructions, each party was required to send their performance data and metering no later than five business days following the event in order to provide us with the appropriate time to conduct the performance analysis ahead of our settlement runs. We successfully reviewed every unit that was dispatched across all instructions.

The table below outlines the payments that were made as a total for each instruction and the associated penalties that were applied following our performance review. We were particularly pleased with the speed at which industry responded to the new service and the desire to support us during these challenging times. During the Summer we withheld a total of 6.8 % of the total money spent on the service for ODFM.

Table 4 Payments per instruction and penalties applied

Dispatch Date	Total Dispatch Value	Performance Penalties Applied	Total Payments Issued
10-May	£124,453		£124,453
23-May	£4,281,853	£154,506	£4,127,346
24-May	£1,373,478		£1,373,478
25-May	£1,237,697	£33,114	£1,204,583
05-Jul	£5,700,439	£621,919	£5,078,520
Totals	£12,717,919	£809,539	£11,908,381

Figure 9 ODFM Service Payments



As a total, we sent 647 instructions under ODFM totalling 9,619MW's of capacity to be instructed. We believe the ODFM has been a great success in supporting the control room during the challenging COVID-19 pandemic and acting as a stepping stone for new participants and technologies to interact with our services and consider transitioning into our BM Wider Access work streams and actively engagement in our response and reserve reform work.

Dynamic Containment (DC)

Dynamic Containment is designed to operate post-fault, i.e. for deployment after a significant frequency deviation in order to meet our most immediate need for faster-acting frequency response.

As we progress towards net-zero by 2050, we are seeing increasing amounts of renewable generation being used to meet electricity demand. However as renewable generation is more variable than traditional generation, such as coal and gas, we need faster acting frequency response products to help us maintain the frequency at 50Hz.

We aim to deliver a new suite of faster-acting frequency response services to support our operations as the electricity system is decarbonised and to make sure that these new services enable a level playing field for all technologies. Dynamic Containment is the first of our new frequency reform services that had its soft launch in October 2020. We currently have over 250MW of capacity registered in the service and we anticipate this will grow as we move through the soft launch period.

What we pay providers

Dynamic containment is paid via a £/MW/h availability fee for the service. As delivery is reflective of current frequency conditions parties are contracted for set periods for which they are remunerated, should the contracted volumes be delivered in accordance with the service specification.

Dynamic containment is procured on a day ahead basis and is currently one of the most valuable frequency response services.

Performance measures

Under the Dynamic Containment service we have created a new set of performance measures that are reflective of the speed and importance of the DC service. Whilst these are in place for the soft launch, We anticipate using the data from delivery and feedback from the market to support the development and fine tuning of the overall performance measures and formulas used.

As a principle we have started with tighter penalties than our monthly FFR product whilst we gain confidence in the new service and learn about how the market delivers and how it impacts on the system. Performance monitoring will remain integral both within our soft launch and the enduring product, to make sure we constantly challenge and review. We anticipate that we will see further developments to the performance measures used under the DC service and will seek to include these changes within future versions of this report as the product grows.

Performance Overview

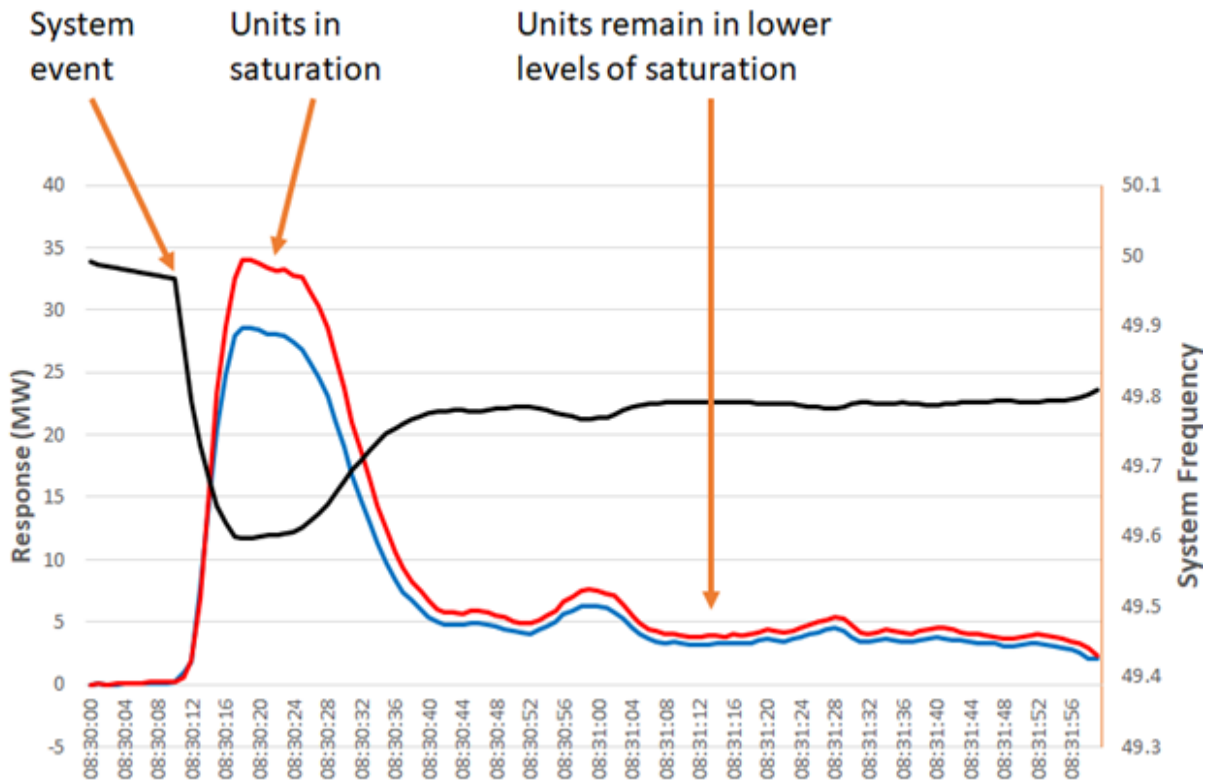
Following the launch of Dynamic Containment, the service was used in earnest on its second day. The IFA interconnector tripped on 2 October moving frequency beyond 0.2Hz deviation, activating the dynamic containment service.

There were 2 units that held contracts at the time, totalling 90MW. This gave us the opportunity to assess the performance of the new service, very early into its soft launch.

Initial analysis shows that both contracted units performed as expected as illustrated in the chart below. At the peak of the system frequency deviation, both units reached approximately 80% of saturation response in line with the service delivery profile. As frequency returned to 50 Hz, both units continued to respond at lower levels of saturation until 108 seconds after the beginning of event in line with our expectations.

We will continue to feature DC in further versions of this report but wanted to share our early insights into the delivery of our new faster acting product and hope that as the market volume grows we will be able to share further insights into the service with the market.

Figure 10 System frequency changes and Dynamic containment response from two providers following the IFA trip on 2/10/20.



Moving forwards

We intend to continuously build on the content of this report and to include further Balancing Services. In the next report, we intend to also include Fast Reserve and the FFR Phase 2 Weekly Auction.

We welcome feedback on this report. Should you have any questions or comments, please do not hesitate to contact us at commercial.operation@nationalgrideso.com



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