nationalgridESO

Dynamic Containment

FAQs

1 June 2020

Contents

FAQs

Question regarding the delay to the procurement of Dynamic Containment

- **Where are the 250MW initially allocated to Dynamic Containment going to be procured?**
  In the short-term, we will continue to actively manage the size of large loss risks and maintain minimum levels of inertia on the system. The Stability Pathfinders and Accelerated Loss of Mains Change Programme (ALoMCP), along with Dynamic Containment, will all play an important part in meeting the operability challenge.

Questions received during the webinar

- **Is the 1000MW aspiration for containment only, or for containment, moderation and regulation combined? How much would be allocated to moderations and regulation?**

  Yes, the 1GW is for DC only, the requirement of DR and DM will be analysed.

- **Is the following correct? Power output from asset = Baseline + Expected response: (a) Expected response results from frequency measurement using DC spec; (b) Baseline is the component around which DC service is provided and is used to control the SoE of the asset.**

  Yes, and also baseline is the expected output from the providers for each settlement period. Yes, baselines are used to manage the SoE.

  We will measure your delivered response power from the baseline that you have previously submitted. Therefore, you will need to be able to accurately follow your baseline.

  We will measure the difference between the baseline and actual metered power output.

- **Operational metering is at the point of connection of each asset in an aggregated unit. Is settlement metering required at the connection point of each asset in an aggregated unit. Or is a single settlement meter per aggregated unit sufficient?**

  Each asset will need to be able to meet the service standards i.e. provide operational and settlement metering standards.

- **What is the ramp rate - in the previous document I have read 5 mins - but is that 5%/min?**

There is a ramp-rate limit applicable to all baselines submitted during the contracted periods.

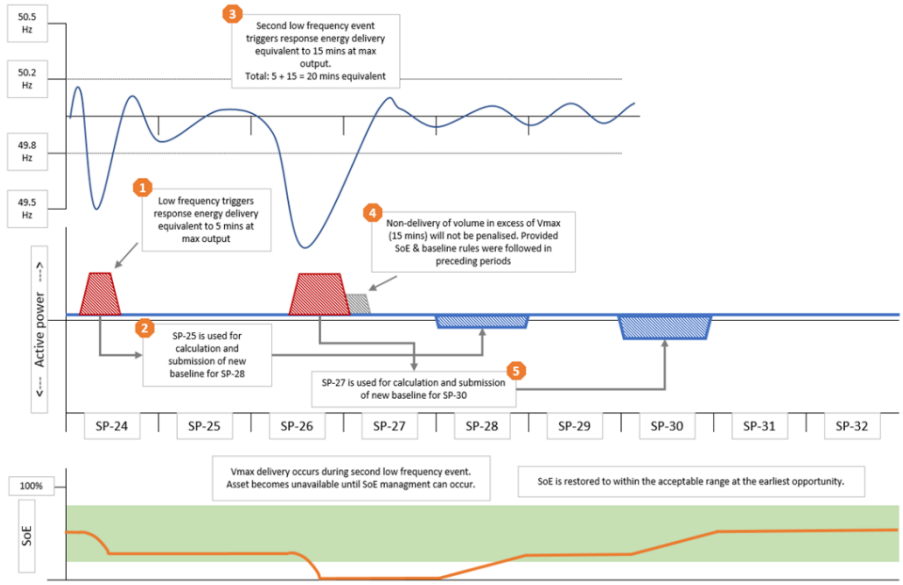
A baseline cannot have a ramp-rate greater than 5% of the contracted quantity per minute. If contracted for 50MW of DCC the maximum ramp rate would be 2.5MW/min.

- **Are you running any trials with existing assets to iron out issues?**

  We are not currently running trials. In terms of what issues we foresee, we are taking learnings from EFR and DC modelling and engaging with industry to find out if they foresee any issues.

- **Is the following correct? At a given SP, SoE deviation of the plant is +10MWh: A baseline must be computed to allow correction of this SoE deviation: (b) The Baseline for correction of SoE will apply from SP+3: (c) If SoE deviation changes between SP and SP+3, Baseline declared at SP (for SP+3) will apply anyway**

  The SoE deviation of plant is at a given SP, the baseline calculation will occur at SP+1 to declare baseline to apply from SP+4.



- **Does this herding affect really exist in practice? Is there evidence - all batteries are different, 1C,2C,0.5C and all are managed differently with differing SoC strategies.... where is the evidence of herding - or is it just theoretical?**

  Learning from EFR has helped shape our work for DC. Evidence of herding (or lack of) will inform how we develop this service.

- **Will assets that are fully DFFT tested, have to be re-tested to participate in Containment (which is more asking to Static)?**

  Yes, as the service parameters are different. This service responds considerably faster so we need evidence the asset is capable of providing the service.

- **What is the required minimum pool size to participate?**

  This is currently under review.

- **Can you give an indication of the performance band for 100% performance – e.g. will it be +/-1% as EFR or something different?**

  As an indication, the tolerance will depend on time as well as error. For example, errors of 3% would only be allowed for 5% of the time and 50% of the time errors would need to be less than 1.75%. The minimum error would need to be less than 1%.

  These figures are subject to change and given to indicate the likely approach.

- **How do you see stacking of service with ESO's current Constraint Management pathfinder? This includes technical contradicts like speed of charge, state of energy, arming signals, availability.**

  We will issue separate advice on if/how this service can be stacked. By stacked, we mean provided at the same time.

  Generally, there will be no stacking opportunities for DC and other already-existing products. Stacking of DC and forthcoming dynamic moderation and/or regulation will be facilitated.

- **Can a provider use the deadband for SoC management like EFR?**

  The only acceptable method for SoE management is via the submission of baselines. There must be no SoE management within the deadband or at any other point on the delivery curve.

- **When will the SoE guidance be issued?**

  We are aiming to have a draft of the contracts out by the end of March which will include SoE.

- **Given that providers have to submit their baseline at gate closure, is there also a requirement to submit energy levels at settlement period level i.e. 30 minutes or at gate closure?**

  Providers will be submitting real time output via their operational metering second by second.

- **What does "baseline may have a max ramp rate of 5% of service quantity" mean?: (a) That the Baseline at SP+1 can be computed 'freely' but that a max ramp rate will apply when bringing the Baseline at SP to Baseline at SP+1; OR (b) That the Baseline at SP+1 must be between Baseline at SP +/- 5% of service quantity**

  Option (a) is the correct interpretation.

- **What would be the minimum allowed duration?**

  Minimum contract period is likely to be EFA block. Service delivery is continuous (when frequency is in the delivery range) except in exceptional circumstances for energy limited providers.

- **40-60% is good, but there are extremes where the natural frequency is low for several hours, driving batteries to go below the min threshold (as storm Ciara) that we saw... is the Grid ESO CCR going to ensure it doesn't place undue burden on batteries by holding frequency sub 50hz for extended periods?**

  Our SoE guidelines and performance monitoring will cater for if ESO run frequency high or low for extended periods and this should not impact a provider's payments. Further information will be shared on this.

- **Do you anticipate the same metering requirements will apply to DM and DR?**

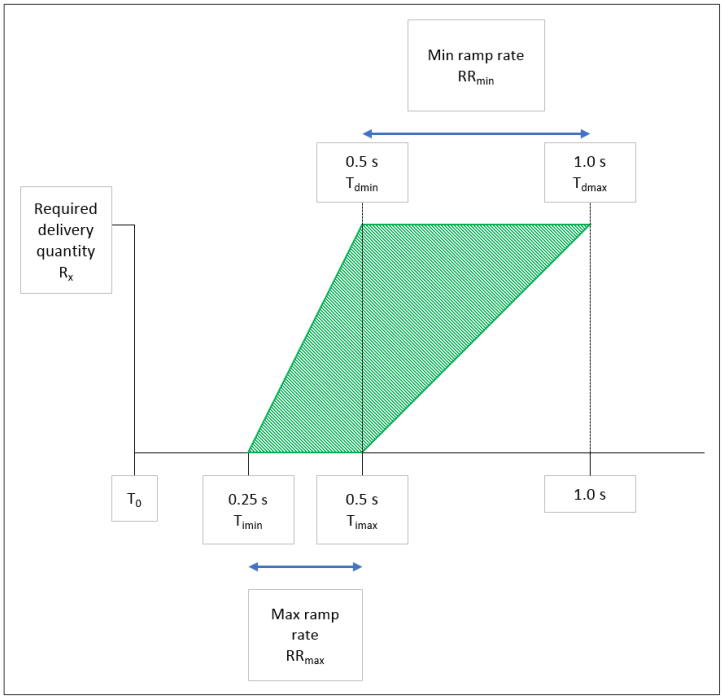
  Further information on the moderation and regulation service will follow. Our approach is to harmonise and simplify so it is likely that many requirements will be shared between the three services.

- **Are you planning to consider GSP groups in the future?**

  This is very unlikely. We have outlined today why it is important for us to have GSP granularity.

- **What are the definitions of lag time and delivery time?**

  Detailed technical description will be available in due course. The image below shows the min/max time for delivery.



- **What is the platform that we will have to use to submit PNs etc.?**

  This will be confirmed in due course.

- **What is the maximum period an asset can bid in for? Is it one week ahead initially and then 1 day ahead?**

The auction will start weekly as per the current Phase 2 time periods.

- **How did you calculate that DR will be 50% more effective than other products?**

  In some scenarios, it can be up to 50% more effective. When the parameters have been finalised, we will have a better measure of effectiveness.

- **How does the ESO intend to handle the amount of data that will come from 20Hz metering?**

  The platform for sending this data will be communicated in due course.

  Day 1 solution: Offline data file submitted as per requested

  Enduring solution: To be confirmed

- **Is testing expected to be similar to existing FFR test requirements or will there be new test requirements released?**

  A new set of tests will be released for the DC product.

- **Please provide detailed information about how the 20Hz settlement metering will be used to derive the Performance Measure.**

  Our contract terms will outline the various performance measures that will be applied to this service.

- **If baselines are submitted at gate closure, there is a risk that delivery of DC in between times prevent adequate management of SoE. How will this be addressed? Will baselines be modifiable after gate closure?**

  Baselines will not be modifiable after gate closure other than by acceptance of BOA or other NGESO instruction.
  Our asset/contract sizing rules should ensure that even in extreme circumstances there is sufficient capacity to respond to a frequency event.

- **It was mentioned at the start of the call that this service was to procure 1GW in both directions and that it would create a level playing field for all technologies. However, as the webinar went on it implied that only a limited number of technologies are being targeted and that a technology must provide both high and low response. Will you consider technologies that only provide response in a single direction?**

  As outlined in the slide pack, initially this will be procured in a bundled fashion but our enduring product will be unbundled so parties can provide low only, high only or combined.

- **What is the actual benefit to Grid of asking for 20Hz data? Seems excessive!**

  To accurately determine performance of the service.

- **When will guidance on asset sizing and acceptable SoE be available?**

  This will be within the first contract draft release which is scheduled for the end of March.

- **If you are an energy limited provider do you need to deliver 100% of your contracted output for the whole 30 minute settlement period?**

  Max energy delivery is stated in the product definition table in the slide pack. Currently proposed as equivalent to 15 continuous minutes at full contracted quantity.

- **I think it will be very helpful to define how frequency is measured. Particularly maximum timeframe over which the frequency is measured and what frequency at 20Hz resolution should even look like (both at testing and for settlement).**

  This will be confirmed in due course.

- **How would you define the compliance of a unit and how would you make that affect utilisation payment - or is this undetermined as of now?**

  A unit will need to pass our testing prior to being able to tender upon delivery units will be performance monitored.

- **Do you foresee that for the other Dynamic products assets will also have to be aggregated by GSP?**

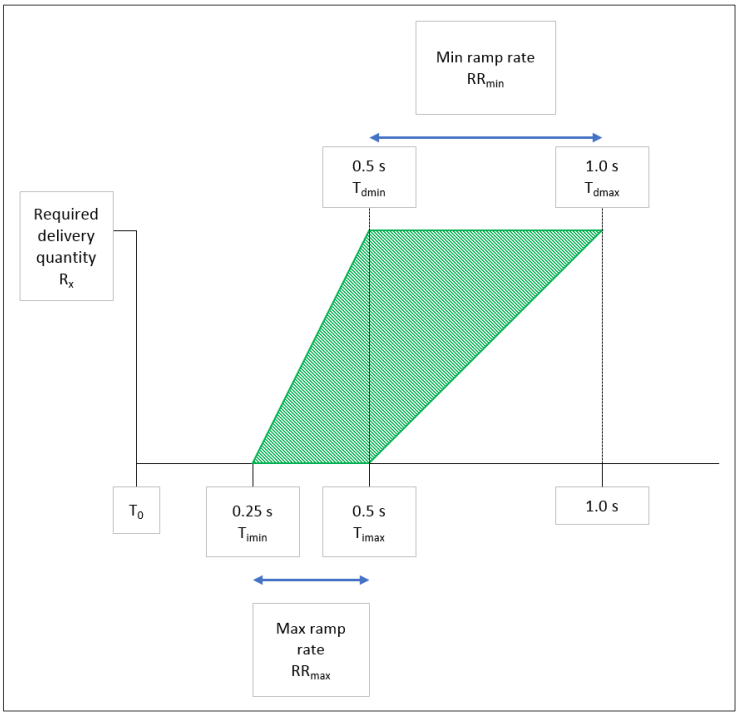
  This is a possibility.

- **How could you stack with Dynamic Regulation given there is active power delivery within operational range?**

  Stacking between products will be discussed in more detail when we launch the moderation and regulation product.

- **How do you define lag time?**

  We define several elements of the response delivery curve. One of them is the time between measurement of a change in frequency and the commencement of the service delivery – we call this the 'initiation time' (Ti) for which there is a minimum and a maximum as shown below (exact parameters to be confirmed).



- **You say that you are expecting energy limited providers to participate and for them to manage their state of charge between 40-60%.**

1) **As I understand it you may be asked to deliver 100% of your rating for the full 30 minute settlement period – if there was an extended low frequency event for example. Is this correct?**
2) **After this your SoE would be zero so the next settlement period would be needed to charge your energy store again. Does this mean you are still participating or are you now considered to be unavailable?**

If the answer to 1) is correct then you are limiting the auction only to providers who can hold full output for 30 minutes – this is just the same as EFR. You are going to exclude novel technologies like supercap based storage because of the need to store a relatively large amount of energy. As you have a short response time you are going to exclude existing rotating machines and the only providers fast enough will be converter connected sources like battery storage or interconnectors that deliberately derate their output to leave headroom for this service – which is very unlikely. Therefore, you are effectively limiting your providers to battery storage, again just like EFR.

40-60% are the preferred levels but it is up to the provider to manage their asset so they can deliver the response required according to their contract. We are assessing what an appropriate level for this is, expect it to be equivalent to around 15 continuous minutes at full power. This equates to 2.5MWh for a provider contracted to deliver 10MW of DCC. The energy requirement is one element of this service that is open to review once we have collected operational experience.

In an extended low (or high) frequency event, this maximum energy requirement could be exceeded – at this point the provider is no longer obliged to provide the service until an appropriate opportunity to manage SoE has occurred. This period of effective unavailability was caused by the ESO and therefore the provider will not be penalised.

There is a requirement for a provider to be able to deliver full power for up to 15 continuous minutes. Whether or not this is a 'relatively large' volume of energy is a matter of opinion.

This is indeed a 'fast' service and will therefore limit participation from some technology types. Our Operability Strategy Report has explained our need for faster acting services. Slower providers will be encouraged to provide other balancing services.

- **What is the minimum duration time?**

  If this is referring to Delivery Duration, as per our current technical design, minimum time for this is:
  - For Energy Limited Providers: 15 minutes at full output or equivalent (e.g. 50% for 30 minutes).
  - For Other Providers (e.g. Wind): continuous delivery is expected.

- **Is the Dynamic suite of products expected to replace non dynamic FFR?**

  Eventually yes, we will share implementation plans for Dynamic Moderation and Dynamic Regulation later this year.

- **Will the real time reporting use IEMS?**

  This will be confirmed in due course.

Further questions from providers

- **Could frequency be measured at GSP group rather than at every asset location?**

  No, a local frequency measurement is required as input to the asset controller.

  The required speed of response (<1s) is such that a local frequency measurement (as input to a controller) is required to avoid unacceptable lag time between any central measurement and relay to local controller.

  Frequency can be different in different locations, this is often the case during a large frequency disturbance – the exact time when DC is required. Again, because of the speed of response of DC, it is important that the local frequency is used as input to quickly contain and stabilise frequency.

Performance monitoring of this service will be based on the input (i.e. local) frequency, not a 'central' frequency measurement. We will ask for your input frequency to assess the level of performance.

- **It's preferred to see a more co optimised auction so they offer a price and ESO can choose most valuable service for the unit to offer. Will this form part of the innovation aspect by trialing such options?**

  We will be reviewing and sharing our learnings from the auction trial in the next quarter. We will also look to make improvements to the auction trial and will engage with providers to get feedback and suggestions.

- **10HZ is manageable today. 20HZ may require manual change to meters and add cost. Would it favour larger sites? Couldn't stream the info, how would we receive the data and at what regularity?**

  20Hz metering has been defined as a requirement for performance monitoring to give us an appropriate level of detail on the performance of assets delivering Dynamic Containment. To be clear, it is not required to 'stream' this data in real-time, it is only required post-event as part of performance monitoring (e.g. as a 'batch' of data).

  We accept that many existing meters are limited to 10Hz and will require an upgrade the cost of which would clearly be more easily absorbed by a larger asset.

- **Soc management through PN. If they didn't follow soc guidelines and submit a large PN what would consequences be? What if they go out of the SOC % range we state?**

  One element of performance monitoring will look at whether or not the baselines submitted were in-line with the rules, specifically:

  - Did they comply with the maximum ramp-rate limit?
  - Did they comply with the absolute limits (dependent on contract and asset size)?

  If these rules are breached, then a penalty will be applied (a deduction taken from the availability fee).

  The same principle applies to SoE, if it is not managed within the rules then a penalty will be applied.

  We are still working on precisely how these penalties are derived.

- **Where does linear proportion start from?**

  There are two stages of linear delivery with an elbow separating them at +/-0.2Hz.

  The proportion will start from 5% of output triggered at +/-0.2Hz and full delivery at +/-0.5Hz of frequency deviation.

  Small linear delivery is required between +/-0.015Hz to +/-0.2Hz.

- **The base line is not defined clearly. Is this a power bid over what period? Is it for each 30-minute market window?**

The baseline is the expected (planned) output for each settlement period (30 minutes).

- **Soc management is not defined clearly. Can Dynamic Containment and soc management happen at the same time? Can they cancel each other? Do I need to take the system out of market or schedule charging and discharging? Can you provide somebody to answer questions from developers working on providing this service?**

  For every SP for which are contracted to deliver, you need to deliver it, even if you are sharing at the same time, so these two could happen at the same time and are not mutually exclusive.

- **In the information pack you mentioned the need to avoid herding behaviour for participants managing their SoE. This makes sense, however in practice if participants are subject to local time based charges e.g. RAG DUOS bands then surely this will incentivise correlated SoE management i.e. everyone will want to charge during green periods and not during red periods. Therefore, how will the service payments avoid this group behaviour? Could participants be paid compensatory rates to charge at other times?**

  Market incentives could be the element to decide whether and when to charge, and they could choose the favourable period to charge themselves if the SOE is within the range.

  However, if SOE is out of range, then they have to charge at the first opportunity.

- **What will the penalty formula look like?**

  A provider will be paid availability only, at a rate of £/MW/hr agreed at the point of contract award (the auction). From this, deductions will be made for the four elements of performance monitoring:

  - **Response delivery** – we will request data for a number of settlement periods during the contract. Each of these will be assessed for performance versus the agreed tolerance and scored with a service performance measure. The worst score will be applied to all availability payments in that contract week.
  - **Baseline acceptability** – for any period where baseline rules were not followed there will be no availability payment
  - **SoE management** – any period outside of SoE range (for any duration), no payment for that SP (note: going outside the SoE range as a result of response delivery is permitted. SoE must be recovered in-line with the SoE rules)
  - **Any unavailability** – no payment for that SP

  We are currently developing the formula and will share this with you soon.

- **What are the expected and accepted practices for State of Energy?**

  State of energy must be maintained such that a providing unit can always deliver the full $V_{maxC(h,l)}$. This is likely to be equivalent to 15 continuous minutes at full contracted output.

If stored energy moves outside of this range the provider must follow the baseline rules and submit at the first opportunity a new baseline that will recover the stored energy back with the acceptable range.

Managing state of energy is the responsibility of the provider.

- **In terms of the gate closure notification, for non-BM will this essentially replicate the Non-BM Data Submission that we created for the new STOR SCTs?**

  The process being created will mirror the timelines that apply to BMUs. Which system and how this will be communicated to NGESO is under review.

- **For operational control room timescales, are you expecting real time metered data flows for each component Eligible Asset, or just aggregated for the Response Unit? And is this to check performance against baseline (i.e. regardless of Frequency fluctuations), or is it to check response delivery against Frequency fluctuations, or for both?**

  Real time metering data is expected from aggregated response units and is required to provide confidence that the service is performing, and will perform, as expected.

  The response performance will be checked against the higher granularity (20Hz) settlement data.

- **Do you envisage that the performance monitoring (e.g. actual output deviates from committed baseline meaning loss of headroom/footroom, failure to provide required response level within headroom/footroom, failure to maintain for Minimum Service Duration etc.) will effectively create a "K factor" which will reduce the weekly availability fee for the Service Provider (as per the Response Auction Phase 2)?**

  Yes, the penalty does translate into a 'K factor' type function and will affect the availability fee.

- **When will the volume cap be lifted?**

  We will be reviewing and sharing our learnings from the auction trial in the next quarter. This includes reviewing the volume and unit caps.

- **Deadband of 5% within 1 second. Response within a second is very difficult due to system controls. Minimum timeframe needs to be 1.5 seconds. The elbow is what causes the challenge. As it goes away from local relay to be processed and sent back to site. Could there be another way to share and show assets are online and ready to respond. Could we bring in the range slightly? Deadband zone parameters may present speed issues.**

  We have assessed options on the speed of this service, the slower it is the more we would need to buy and the less capable it is in meeting our operability challenges. It is possible that the service will need to be made even faster in the future as system conditions evolve.

  We know that <1s is possible by a range of technology types. Slower providers will be encouraged to participate in the dynamic regulation service when it is launched.

The question implies that the time delay comes from communication between measurement and controller – this is precisely why we have asked that frequency is measured locally.

The deadband range is limited by provisions laid out in SOGL article 154.

- **PN's can only be sent in integers. How can smaller batteries share soc/baseline as this cannot be submitted if decimal values?**

  System limitations such as this will be considered in the SoE advice that we provide.

- **For an aggregated asset, can it be stored at an aggregated level rather than unit by unit?**

  Delivery and contracts are monitored on a unit basis. Assets must be explicitly tagged to a unit ahead of the auction.

- **Or, alternatively, am I right in understanding that the baseline will effectively be a commercial parameter for the Response Unit that the service provider will be free to notify prior to gate closure, with an accompanying "state of energy" indication (for BM could be MEL/SEL?), so long as it is consistent with the Contracted Response Capacity derived from the tender (so as to give sufficient headroom and footroom)?**

  The baseline submission rule is the same as PN submission rule in Balancing mechanism, which means, they are free to notify prior to gate closure.

- **Is the Minimum Service Duration going to be a set factor applicable to all providers, that will never/rarely change?**

  To clarify, the service duration is continuous. There is no minimum or maximum duration.

  The only exception is for 'energy limited' assets – assets that need to manage their state of energy. For these assets, the maximum energy delivery is equal to fifteen minutes continuous output at maximum contracted power.

  An energy limited asset contracted for 50MW of DCC would need to maintain an SoE to always be able to deliver 50MW for 15 minutes, 12.5MWh.

- **I need a quick answer on whether the project connection location is affected by network constraints and is ineligible for this product?**

  Eventually, our procurement of Dynamic Containment will have a locational element – we don't want to procure all the volume in a single region for example. Initially, we will not have a locational requirement.

- **Interconnector - We currently provide HF and LF, will this stacking restrict us from submitting into the auctions and providing other services?**

  We will issue separate advice on if/how this service can be stacked. By stacked, we mean provided at the same time.

  Generally, there will be no stacking opportunities for DC and other already-existing products. Stacking of DC and forthcoming dynamic moderation and/or regulation will be facilitated.