Question	Answer
Load/ generation imbalance effect on frequency drift/ time is influenced by levels of inertia- how do you balance DM with inertia needs? Do you model a dead-band (c.f.+/- 0.015Hz FSM) between DM & DC to avoid response mode hunting at edges of regulation? key if GFm control mode used in future.	The pre-fault system imbalance referred to in this webinar relates to small mismatches between supply and demand that cause frequency to fluctuate around 50 Hz. In these cases, the impact of inertia on frequency movement is less significant compared to that under large power imbalances. The utilisation of DM is part of ongoing development work, and we will share more details on this once the design is finalised. DM requirements are not directly tied to low inertia but are more associated with increased system volatility. In future system conditions, DM will increasingly align with managing this volatility. As part of response service modelling, the deadband is implemented in line with service design specifications. For the modelling of DC and DM response, a ±0.015 Hz deadband is applied. The response unit maintains output once activated, avoiding continuous adjustments beyond the deviation, and preventing any hunting behaviour. The response remains stable, and as frequency deviation reduces, the system does not oscillate or repeatedly shift control actions. The provision of DC, DM, and DR services operates in parallel, based on frequency deviations and their respective response delivery curves. When a unit provides multiple services simultaneously, its delivery curve needs to be an aggregate of the contracted
Do you consider the time taken for these statistical deviations and feed into assumed latency of service delivery/ control of the service? is there a speed of deviation at which point you just need to move to DC and DM/DR classification becomes somewhat opaque?	Dynamic frequency response services are triggered automatically based on system frequency deviations and their defined service characteristics including time delay. Each service operates independently, according to its activation criteria, and does not rely on the response of other services. While all services are modelled with their specific latency and activation profiles, the classification between DC and DM/DR remains clear within the current framework. However, at higher rates of frequency deviation, the system may prioritise faster-acting services such as DM to ensure stability, depending on the severity and speed of the event.

Network parameters for demand- assuming these change by service modelling?- for DM demand isn't moving much with freq, in DC, the demand & DER effect can move around alot more by freq. Can more monitoring be done at the DNO level to inform this? otherwise risks of over-shoots & service interaction.	Modelling is done with both a slow-moving demand and generation (general movement of demand/generation throughout the day) and with an instantaneous loss (representing a fault loss of demand or generation). All 3 services are modelled simultaneously to respond to these events but activate based on the service specifications. The post-fault frequency security is primarily evaluated through the FRCR process, where the system is assessed under various conditions. Currently, the information available at the DNO level is quite limited and does not provide extensive details. There are some workstreams ongoing to better monitor the power flow at DNO levels, we will broadcast more progress in later communication.
This analysis appears to focus on reducing frequency deviations by purchasing more response services. Has there been any consideration of improving the dispatch process to better match dispatched generation to demand, rather than relying solely on increased response services?	Thank you for your comment. As mentioned at the start of the session, this statistical and mathematical analysis is being carried out in parallel with other investigations aimed at understanding the root causes of frequency deviations. Another team within NESO is actively analysing operational and dispatch-related factors that may contribute to these changes. In addition, there are ongoing workstreams focused on improving forecasting, modelling, and monitoring tools—taking a whole-system perspective. While this particular webinar is centred on frequency modelling, we will provide further updates on related initiatives across the wider programme as progress continues. It's also worth noting that the DM market remains relatively liquid and currently offers a practical short-term solution. However, we recognise that longer-term improvements—such as refining the dispatch process—are equally important and are being considered as part of the broader system development strategy.
In Oscillations & delta DR slides you've highlighted uncertainties in modelling- Standard dev of these uncertainties as they combine should influence margins /distributions of resources at a given time? Further innovation focussed in these areas could be identified to minimise uncertainties/ margin?	The standard deviation of modelling uncertainties, particularly in relation to oscillations and delta DR, could influence how margins are set and how resources are distributed in real time. This is an area that warrants further investigation, and we will take this suggestion away to consider whether there is scope for future innovation or operational work to address and potentially reduce these uncertainties.
what about the impact of Power Electronics/ IBTs working together but differently.....would this impact the level of recent Oscillations witnessed?	As part of the ongoing investigation into system oscillations, we assess the performance of service providers to determine any potential contributions to these events. At present, there is no clear evidence indicating that power electronics or IBTs have played a significant role in the recent oscillations observed. That said, we will continue to monitor and analyse the behaviour of these technologies to further understand their potential impact on system dynamics during oscillation events.

Has NESO given any further thought to Automatic Generation Control, rather than relying on "human in the loop control", as a means of cost effectively reducing frequency deviations? It is for example mentioned in https://www.neso.energy/document/143856/download	Automatic Generation Control (AGC) is not adopted in the GB system. Instead, a variety of tools and services are used to achieve similar objectives. One aspect of AGC is ensuring that power interchange agreements between different areas or utilities are met accurately. This is not applicable to the GB system, as there is only one single control area. Previous cost-benefit studies indicated that the costs of implementing AGC outweigh the benefits. We will refresh these CBA studies to see if the situation has changed.
For loss of main scenarios or simultaneously events, is there any cooperation between DM and DR services? Any certain activation sequences is considered of DM and DR services?	Thanks for the question. Dynamic frequency response services are activated automatically based on system frequency deviations and its service characteristics. Each service activates independently on each other, based on its own measurement of frequency.
Please note the imbalance is not as stated between supply and demand. It should be made clear that it is a mismatch between DISPATCHED generation and demand. The combination of inertia and frequency response services ensure total supply and demand	Thank you for the clarification. In our model we assume at any timestamps, the supply contains dispatched generation, response and demand response. We appreciate the distinction, and will ensure this is clearly reflected in future communications.