Answered to audience?	Question	Answer
Yes	Rob. Any wiggle room in the consultation dates?	Some small flexibility on dates but no room to move on 1st April as this is dictated by Ofgem as the date that the 1st FRCR submission is expected [which is when the change to the licences which will implement the new version of the SQSS is anticipated].
Yes	Question from Orsted: Do NGESO have a view on how often the FRCR will be run/updated? Will it be based on new connections, seasonal changes, loss of connections (de-commissioning of synchronous generation).	At least once per year, but we expect that major milestones such as new controls, new connections etc. might mean we do it more often as necessary.
	Is there a timeframe considered for Transient Frequency deviations?	Of the order of 60 seconds, per the SQSS definition up to v.24
Yes	[10:17 AM] Marshall, Benjamin From my initial read of the FRCR document, it focuses on national containment considerations but does not note that many of the factors influencing this - for example size of RoCoF measured locally are not uniform for the first few seconds of a given event based on published ESO researdh. it is not clear how such variations are baked into your strategy to contain "knock-ons" such as Loss Of Mains protection- do you include a margin to cover for larger effects in given areas e.g. converter concentrations, or is the strategy to procure complimentary stability products to even out these effects? or something else?	The potential for differences in local and national frequency is expected to become more and more important in future. This is part of our Stability Pathfinder and Frequency Response Reform considerations for the design of future services.
Yes	[10:22 AM] Sridhar Sahukari is VS also not dependent on line loading pre-event. To avoid an anticipatory failure, are there any measures taken to alter the generation despatch?	It is a minimal impact in terms of the overall size of a Vector Shift loss, so we don't actively take any measures to alter the generation dispatch.
Yes	[10:22 AM] Marshall, Benjamin The 9th of august event included both frequency and voltage disturbance simultaneously. This is not uncommon, but is not obviously mentioned in the general policy table of events? it is a SQSS scenario though- should it be included or is it already but hidden [10:30 AM] McNabb, Patrick (GE Digital) (Guest) https://www.nationalgrideso.com/sites/eso/files/documents/SOF%20Report%20-%20Frequency%20and%20Voltage%20assessment.pdf	Both are clearly considerations and are part of operating the system securely. Voltage performance has separate criteria both in the SQSS and the Grid Code as well as in several of the supporting standards such as G5 and P28 that are administered by the Electricity Networks Association (ENA). Clearly any frequency event is likely to be accompanied by voltage issues although the reverse may not be true as voltage problems tend to be more localised in nature. In terms of what the ESO spends to secure the system, frequency is generally the priority as the

	[10:31 AM] McNabb, Patrick (GE Digital) (Guest) Part of the SOF examining the voltage and frequency link mainly through load voltage dependence (which acts to effectively increase inertia).	consequence of losing control of this is much greater and less geographically specific.
Yes	one concern of your chart on event likelihood in General Policy is that it seems to be looking back at what has happened- the recent operability strategy and various other ESO operability documents have show declining trends of factors influencing likelihood and consequence. as with Orsteds earlier comment, regular review and forecast of these risks and likehoods within the document would be extremely helpful in ensuring robust frequency containment for the next year(s).	As set out, the analysis for the first version of the FRCR will use historic scenarios adjusted for known or expected changes expected in the coming 12 months; and this is something we will look to build on in future versions, which is why it's important that this is a regular process, particularly during this period of significant transition for the system.
Yes	[10:27 AM] Ajai Ahluwalia In relation to BMU loss size, i just wonder how that relates to future 1GW+ wind farms which are HVDC connected. really the limitation will is the OFTO capacity rather than the BMU size? [10:29 AM] Platt, Nigel (SE GP T SO LTS GB SYS) (Guest) Especially if we build 2.6GW links as proposed in the OTNR [10:29 AM] Cullen, Matthew Same as Ajai said, but also need to include interconnectors as well [10:32 AM] Mike Gordon (Guest) I think the general comment on the above new large losses is the SQSS planning criteria for largest loss should be reviewed for their onward impact on operation costs. Or perhaps the horse has bolted with Hinkley C etc. [10:35 AM] Cullen, Matthew (Guest) Mike Gordon. how is that going to work with the Energy White Paper suggesting more sharing of connections from large wind farms in the North Sea. We could easily have >2GW landing at a single point on the network?	Yes, we'll be considering all new and existing connections to the National Electricity Transmission System, including offshore wind and interconnectors. The FRCR will be well placed to inform any future discussions about increasing the largest infeed loss risk.
Yes	What do you mean by reducing LOM Loss Size? Do you mean increasing the ROCOF limit (e.g. 0.125 to 0.2Hz/s) or do you mean reducing the infeed loss - e.g.by trading on interconnectors?	Reducing the LoM loss size is achieved by changing the protection settings of DER through the ALoMCP; so our analysis will look at the pipeline of changes anticipated to flow through as a result of the programme and their impact on reducing LOM loss size.

N/A	[10:29 AM] Andrew Larkins Voltage disturbance will have an impact on consumers. This may be a minor flicker of a light to internet router reset. Most loads are not frequency sensitive in the range 49 to 51Hz. To get any meaningful input from consumer groups there needs to a an understanding of the link between voltage and frequency disturbance.	Thank you for the feedback – this is a great example of the types of input we are seeking through this process to produce to inform future reports.
Yes	[10:35 AM] Sridhar Sahukari It would also be good to know what involvement the DNO's will have in the process. We saw on the 9th August 2019 the impact that embedded generation can have. How will this be estimated or measured, if it is not estimated/measured accurately the consumer could end up over paying for services that either are not needed, or not sufficient. So will there be a real time demand/generation estimate from the DNO's?	We're working close with the ENA, DNOs and embedded generators through the ALoMCP. We forecast these loss risk and constantly refine our models. In addition to data from actual events, we have gained a significant volume of data through the ALoMCP to inform our understanding of LoM settings.
Yes	[10:37 AM] Marshall, Benjamin Loss Of Mains loss size- is this visible in real time or does it need to be estimated based on available limited metering? if the latter, a risk of estimate error, compounded by black swan always exists. There is an opportunity to look at containment differently following new ENTSO-e codes- they define an LFSM-U service capability (where headroom may be used for frequency response in an extreme low frequency event- eg part loaded batteries, interconnectors etc). in GB were we to define an LFSM-U delivery as a safety net to deploy ahead of demand disconnection, this rapid response could provide additional resillience at times of particular uncertainty- is this worth investigating/ being investigated?	As above
Yes	[10:38 AM] Andrew Larkins Load voltage dependence from devices such as EV charger and variable speed motor drives is moving more towards constant power loads. This has the potential to increase the need for inertia. Is this change nature of loads being considered? There are options for large scale demand side response to help mitigate this change.	Thank you for the feedback – this is a great example of the types of input we are seeking through this process to produce to inform future reports.
	[10:40 AM] Sridhar Sahukari (Guest) What would be an example of typical targeted controls?	Reducing the size of a BMU
	[10:44 AM] Marshall, Benjamin (Guest) On interconnector loss/ impact, GB now has several interconnectors with continental Europe, many co-located or near located on those external systems, and operating to very different loss	Yes, these are the sorts of new events and loss risks we'll look to consider in future editions of the FRCR

	tollerances within those continental TSO systems. It should be possible to ensure via existing CORESO and other code avenues that any continental european risk for multiple interconnector disconnection or depletion is also captured in FRCR?	
	[10:45 AM] Sridhar Sahukari Will there be a revision of LFDD levels as a consequence of this work?	A separate workgroup formed under the Energy Executive Committe (E3C) and Power Disruption Implementation Group (PDIG) is looking at the Low Frequency Demand Disconnection scheme. We do not anticipate a change as a result of the FRCR, but will consider any change that do arise from the workgroup.
	[10:46 AM] Nicholson Guy 9th August was a "simultaneous event" - why is this not being considered now rather than in future as you plan?	It was noted by Ofgem in their decision letter on GSR027 as follows: *'Given the significant increase in complexity, and reduced probability of occurence, of simultaneous events, we consider it appropriate that this not be considered in the initial FRCR Methadology'.* https://www.ofgem.gov.uk/system/files/docs/2020/12/sqss_gsr027_authority_decision_0.pdf
	[10:46 AM] Cullen, Matthew Won't a large deviation (which is rare) cost more to mitigate so the steps are larger but not necessarily less steep?	The size of the steps will vary according to the individual cost/risk rank of applying to controls to that event
	[10:47 AM] Rick Parfett Apologies if this is a silly question, but what are the properties of the ESO's new set of frequency products that will allow you to address simultaneous events in a way that the current products don't? Is it speed of response? Granularity of data? Or something else?	The fast-acting nature of the new Dynamic Containment service is the key property of the service, allowing it to catch the rapidly changing frequency
	[10:49 AM] Rick Parfett Have the ESO analysed the IT changes that'd be needed to address simultaneous events, given the analytical complexity/data volume concerns cited? How quickly could this be done?	This is a part of our considerations in establishing the data and analysis for this first edition of the FRCR, to allow us to build on this in future editions.
	[10:49 AM] Rick Parfett Will the report look into the possibility of increasing the amount of inertia procured in the future? And could a bespoke inertia market emerge via the Reserve reforms?	The first edition of the FRCR is focusing on Dynamic Containment and reducing the LoM loss size. Other controls, including inertia, are likely to be be investigated further in future editions.
	[10:55 AM] Rick Parfett Will the report compare the risks/costs/benefits of removing the tighter limit for smaller losses	It will be compared against the full suite of controls: holding frequency response, increasing inertia, reducing BMU loss size, and reducing LoM loss size

	directly against procuring more frequency response?	
	[11:02 AM] Rick Parfett Will the link to answers on website be emailed to attendees?	Yes
	[11:02 AM] Marshall, Benjamin (Guest) Mathew- on offshore loss the ESO Offshore Co-ordination Project identified potential value in reviewing the normal infeed loss risk as applied to offshore networks within Chapter 7 of the SQSS. that would potentially increase up to 1800MW but not further. i'm not clear this is included in GSR027 consultation?https://www.nationalgrideso.com/future-energy/projects/offshore-coordination-project/documents	The FRCR is focused on the operation chapters of the SQSS (5 and 9), but the result may inform further work on codes and standards.