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NESO reply to consultation comments

NESO would like to thank Dr J A Cullen for his engagement in the FRCR consultation and acknowledge all his comments. NESO had a follow-up meeting to clarify detailed questions and concerns from Dr Cullen. Key discussion points are summarised below and FRCR related questions are addressed in the table.

Summary of Discussions:

- Electricity system stability

Dr Cullen highlighted the system stability challenges posed by renewable energy sources like wind and solar, that are highly dependent on weather conditions. He highlighted the need for base load power sources for example nuclear generation to mitigate the risk associated with relying heavily on intermittent renewable energy sources. Dr Cullen also raised concerns about the life and capacity of existing GB nuclear plants, and pointed out many existing gas generators are approaching their end of life and the need of new generators and ensure they are running economically to maintain system stability. Dr Cullen expressed the need for increasing system inertia to ensure system stability.

- Role of inertia

NESO acknowledged the importance of system stability and the importance of maintaining sufficient inertia to manage system frequency. We explained that inertia determines how fast the frequency moves to another steady state following an imbalance in the system. Increasing inertia does not solve the problem of frequency excursions as referred by Dr Cullen, as inertia only affects the speed of frequency movement. We emphasized the need for increased response to manage frequency deviations effectively. We explained the new dynamic response services, e.g. Dynamic Containment (DC), which involves using batteries to provide fast frequency response. Procuring fast responses is more cost effective for managing frequency compared to increasing system inertia. The FRCR analysis presents a cost-benefits analysis between increasing inertia and procuring more dynamic services to achieve a balanced position, based on which, it recommends that we can run system at 102 GVA.s without compromising system security. In operation practice, the outturn system inertia could be higher than the recommended minimum requirement. That is driven by other operational requirements that could instruct additional synchronising units which also contribute to the overall system inertia.

- Wider system operability and Clean Power 2030

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NESO Clean Power 2030 (CP30) report presents our technical analysis on the foundations for clean power considering all the operational needs and beyond. To further discuss and address Dr Cullen's wider concerns about long-term generation availability, reliance on renewables and broader operability risks, NESO will organise a separate meeting out of FRCR process but aligning with CP30 implementation plan.



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Please find our response to your valuable input below.

No	Questions	Comments	NESO Response
7	Do you agree that the FRCR 2025 has been prepared appropriately? Please elaborate...	No comment.	Thanks for your feedback
8	Do you believe there has been sufficient industry engagement in preparing FRCR 2025? Please specify further suggestions.	No comment.	Thanks for your feedback
9	Overall, do you agree that the FRCR 2025 represents the appropriate level of development in determining the way that the NESO will balance cost and risk in maintaining frequency security while operating the system at a reduced inertia down to 102 GVA.s? Please use the boxes below for the bullet points.	I am strongly opposed to any reduction of the inertia held on the grid for the reasons set out in Kathryn Porter's "Blackout Risk in the GB Grid" report (https://static1.squarespace.com/static/656f411497ae14084ad8d03a/t/679a24b62b650015dd2baba2/1738155194172/Porter-Blackouts.pdf), namely that (i) grid inertia has been falling and frequency excursions have been increasing – see report at Figs. 4 and 5, (ii) as the blackout near-miss of 08/Jan'y/2025 showed there is already insufficient power back-up (i.e. synchronised spinning reserve also provides inertia) and so reduced inertia will make tripping more likely even with a small fault, and	<p>Thank you for sharing the report with us. We will respond to each point accordingly from FRCR point of view only.</p> <p>Regarding point (1), we acknowledge that the system total inertia is decreasing due to the increased penetration of renewable energy sources. While inertia influences the rate at which frequency changes, it does not directly drive the frequency excursions in this scenario. These excursions are primarily due to volatility on both the demand and generation sides, which could be caused by the natural uncertainties introduced by the renewable energy sources. Increasing inertia alone will not address this issue, as it does not mitigate the natural</p>

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		<p>(iii) in the light of the Clean Power 2030 plan any reduction of inertia reinforces Porter's comment that "The country is not sleep-walking into a security of supply disaster – under CP2030, it is running headlong into it." So INCREASING INERTIA IS REQUIRED !</p>	<p>imbalance. To enhance frequency quality, we have increased the holdings of response services, specifically Dynamic Regulation (DR) and Dynamic Moderation (DM), to improve system frequency quality within operational limits. We will continue to monitor frequency quality and adjust our requirements for DR and DM as needed.</p> <p>Regarding point (2), the key challenges we experienced on Wednesday 8th January were driven by weather, i.e. a few weather warnings in place across large parts of the country, very low temperatures, high demand, and particularly when approaching the evening there were a drop of around 2 GW in wind forecast and an increase in demand. Inertia for that day was much higher than the minimum requirement of 120 GVA.s. NESO has published detailed analysis and review regarding the tight margin day operation on the 8th January 2025. You can find details from here.</p> <p>Regarding point (3), we briefly discussed and explained this in the meeting. As the electricity system operator, we consider all aspects of operational requirements to ensure system security. Those requirements include but might not be limited to,</p>
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			<ul style="list-style-type: none"> • Balancing needs between demand and generation, • Head room and foot room margin requirement to back up any energy losses on the generation side and the demand side, • Power flow constraint limits to ensure power flow from one point of the network to the other does not exceed the circuit capacity, • Response requirement so we can contain the frequency following a secured event, • Locational voltage requirement to protect network asset and personnel safety, and • Other locational requirement, for example, minimum and maximum short circuit levels, to mitigate locational events etc. <p>NESO Clean Power 2030 programme and report starts with our technical analysis on the foundations for clean power considering all above operational needs and beyond. The programme also developed a range of pathways, with expert analysis of the location and type of new investment and infrastructure needed to deliver CP30 goals.</p> <p>FRCR and frequency control mainly focuses system frequency management and response requirement. Based on FRCR 2025 analysis, we</p>
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			are confident GB system can be operated at a lower inertia requirement presenting consumer benefits without compromising system security. FRCR 2025 presents the analysis, highlights the consumer cost saving and the system residual risks, and presents our recommendation of 102 GVA.s as the minimum inertia requirement. When operating the system, if additional generating units are required for other operational needs, the outturn inertia could be higher than the FRCR recommended minimum requirement, NESO can well justify the need to ensure system security.
10	Do you agree with the recommendation to reduce minimum inertia requirement down to 102 GVA.s?	No!	Thanks for your feedback
11	Do you agree with the recommendation to secure all BMU-only events (including consequential RoCoF)? If not, please explain why.	No comment at this time.	Thanks for your feedback
12	Do you agree with the recommendation to procure additional DC-Low service provision by 200 MW ? If not, please explain why.	No comment at this time.	Thanks for your feedback
13	Do you have any other comments to the recommendations?	Empirical data always trumps modelling in the real world.	Thanks for your feedback

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14	In your view, what should the future FRCR focus on?	No comment at this time.	Thanks for your feedback
15	Do you foresee any issues that may arise from moving the obligation to produce the FRCR to a NESO License Condition rather than an Annex to the NETS SQSS?	No comment at this time.	Thanks for your feedback
16	If the obligation to produce the FRCR and the governance rules surrounding that process are moved to NESO's License, do you believe that the NETS SQSS Panel should continue to provide oversight?	No comment at this time.	Thanks for your feedback
17	If your answer to question 16 is "Yes", to what extent should this oversight be? For example, should it include technically assessing the recommendations and approving/rejecting it, or should it be limited to confirming that the governance process has been followed correctly?	No comment at this time.	Thanks for your feedback