National Grid House
Warwick Technology Park
Gallows Hill, Warwick
CV34 6DA

T+44 (0)1926 653000
F +44 (0)1926 654378
www.nationalgrid.com

Peter Bingham
Chief Engineer
Ofgem,
9 Millbank,
SW1P 3GE

Julian Leslie
Head of Network Capability, Electricity
Julian.Leslie@NationalGrid.com
Direct tel +44(0) 7901 516638

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System Operability and Interconnectors

Dear Peter

Existing and future interconnectors are a valuable resource for improved security of supply at economic cost because they can enable the exchange of power and flexibility with other countries across continental Europe. Due to the size and number of interconnectors, and the way the flows across them depend on European continental market prices and market arrangements, we will have to develop and adapt the way we operate the GB networks as their capacity grows and the rest of the industry continues to change.

As discussed in our System Needs and Products Strategy document, currently the most economic and efficient option to limit RoCoF (Rate of Change of Frequency) is to reduce the largest secured infeed loss. This is done by trading or by taking BM actions to reduce the level of generation or demand that comprises that largest loss. The current cost of managing RoCoF in this way is £30m per annum. We also highlighted that without further work to desensitise RoCoF relays (those below 5MW) National Grid would increasingly be required to take action to manage RoCoF with an expectation that this could be over 60% of the year by 2021/22 given a Consumer Power energy background costing approximately £100m per annum[1] using current methods of reducing largest loss and synchronising additional machines.

However, we are working with distribution network licensees and their customers to desensitise Loss of Mains Protection (RoCoF) settings. Settings for new smaller generators (less than 5MW) have now been agreed and subject to approval by Ofgem will be implemented from February next year (2018). Setting changes for existing generators will take longer to implement and is on an unprecedented scale in the GB electricity industry. However, subject to the necessary agreements, this work should be completed by 2021 and will allow us to balance the system with less inertia (approximately 1/3 of current requirements) resulting in a reduction in actions taken by National Grid to manage RoCoF. Therefore, subject to timing, the lifetime impact of the current RoCoF limit on Window 2 projects (GridLink, NeuConnect and NorthConnect) is likely to be low.

When the changes are made, our latest published view of costs avoided in 2020 is £56m per year rising to £128m per year in 2025. The most significant driver for the cost increase between these years is the connection of new interconnectors, consistent with our message that Loss of Mains protection setting changes can be, and need to be completed by 2021. Please note that we are in the process of revising this analysis as part of the CBA required to progress Loss of Mains setting changes. This analysis will include an updated view on avoided costs but we do not expect to change our thinking in this area. Please note also that this analysis does not include the impact of the Hinkley

[1] Forecast RoCoF costs based on FES 2016 data

Point C connection as it is only extended to 2026 but we would be happy to talk through the range of plausible outcomes with you.

Looking beyond Loss of Mains protection, we have also procured faster acting response, Enhanced Frequency Response (EFR), to secure the system with increased RoCoF. As part of our ongoing modelling and evolution of frequency response, we are looking to introduce and procure further faster-acting frequency response products. This work will mitigate the increasing requirement for procurement of standard primary and secondary response driven by the reduction in system inertia and increase in RoCoF, and will hence reduce the risk and impact of large infeed loss curtailment. We will also be working with the industry on how best to place a value on inertia and other key technology features (such as short circuit infeed) as part of open and competitive processes. We see this as a key enabler for the transition to a low carbon system and the accompanying change in the technology used in the electricity supply mix. We will also continue to investigate and develop innovative technological solutions which open up opportunities to co-ordinate flexible resources across the whole system. Projects like EFCC (using monitoring and control systems to provide enhanced frequency response on a weak system) and Phoenix (looking at the value of hybrid synchronous compensation) will provide vital learning opportunities for us to do this.

In summary:

- Timely resolution of the Loss of Mains Protection issue by the industry, and the initiatives we are pursuing to deal with low system inertia, will mean that Window 2 projects will not be unduly constrained; and
- There is sufficient time and known technological solutions to address current operability issues which could impact on the Window 2 projects over their lifetimes.

Yours sincerely

By Email

Julian Leslie
National Grid