Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: Black Start from Distributed Energy Resources

Tick if this answer has been provided verbally: ☐

Project code	ESOEN01	Question Number	47
Question date	6 Sep 2018	Answer date	10 Sep 2018
Submission section question relates to	Section 4: Benefits, timeliness, and partners		
Topic	b) Value for money		
Question	While there are significant differences in the type of services to be procured, the commercial and interface processes of procuring Black Start services from DERs and potentially enacting them through the DSOs has similarities with those proposed in Power Potential and EFCC projects. For example, in the case of Black Start and EFCC there is a few-to-many step up in the number of service providers. In Black Start and Power Potential there is a need to engage with the DNOs/DSOs to ensure that the services are executed and a protocol for how they will be planned for in the short-term and despatched. For the Black Start Project and, where appropriate, for DER Black Start BaU, can you please explain what learning there has been from these two projects (EFCC and Power Potential) with regard to: 1. How the interactions with the DNOs/DSOs will be managed in terms of (a) overall coordination of the services (i.e. how delivery of the services are planned for at the outset and procured) and (b) confirmation by the DNOs of availability of service providers based on the state of their network on a daily, weekly, etc. basis. 2. How the markets or bi-lateral commercial interactions with many parties (compared to the number of existing Black Start providers) will be managed. If applicable, also explain why the learning from those projects do not apply to Black Start from DER.		
Notes on question	Supporting info: The Enhanced Frequency Control Capability (EFCC) NIC project is seeking to deliver higher volumes of frequency response to the electricity system, by utilising greater proportions of distributed connected generation. Whilst		

	there are some system constraints to where this service can be delivered from, the service is not limited theoretically by electrical or geographical boundaries. The NIC Project Power Potential is seeking to deliver greater reactive power capability to dynamically control voltage, and active power support for constraint management and system balancing by harnessing the capability of distributed connected generation. This service needs to be delivered from connections within electrical proximity of the thermally or voltage constrained network area. The key difference to EFCC in particular, but also to Power Potential, is that Black Start services are geographically spread across Great Britain, to aid resilience (e.g. storm damage) and to optimise TO and DNO human resource utilisation during such events. Each specific self-starting site must also have the capability to energise as far as a suitably sized demand point and the next (non self-starting) generator. At a high level, the requirements can be more flexible, at the secondary layers capability becomes very specific.
Answer	The type and location of generation connections is changing, with an increasing proportion of connections at the distribution level and a growing number of these involving renewable technologies. It therefore follows that both the availability as well as the quantity requirements of ancillary services is also changing. For Reactive power and Frequency Response, there are two NIC projects in flight (Enhanced Frequency Control Capability – EFCC, and Power Potential – PP), a summarised description for both of which is included in the supporting information. We have carried out a preliminary assessment for initial outcomes from both EFCC and PP, and already see the need to ensure that the initial learnings from each be considered, but we also need to ensure that the differences between the projects be correctly taken into account. As mentioned in the bid document, we intend to complete a more indepth assessment of the EFCC and PP projects in order to benefit from the efficiencies of using lessons learnt. When it comes to the interactions with DNOs/DSOs for managing and co-ordinating the service, we found that in both the EFCC and PP these interactions are minimal. Although the DNO certainly is heavily involved with the placement of specific equipment and with the data flows into the Electricity System Operator (ESO), from this predetermined system, the day to day operational requirements and instructions are set by the ESO rather than the DNO. In contrast, for Black Start self-start capability, currently the ESO sets out the strategy of the restoration and co-ordinates nationally, understanding plant and network availability, wider restoration priorities and objectives and monitoring the progress of the restoration. The Transmission Owner and DNO work with the generator to achieve the self-start, and expand this Power Island until a further generator or DNO become involved, where control coordination is handed back to the ESO. Without prejudging the outcomes of the NIC project, we do have some initial thoughts of how Black Start from DERs might be managed in the Whole Electricity System future,

	which includes a much more active role from DNOs/DSOs. Although the plan for developing these complex interactions is included in the scope of the project, we see a need for; • a route for DERs to form service partnerships with each other, to deliver the capability. • an option for DNOs to engage with the potential service partners, to ensure that the capability achieves the local network requirements. • the ESO to implement an efficient and standardised procurement approach across GB. It is possible that the DNO/DSO change could lead bids with DER partners to provide the service in their zone, with further competition being introduced across GB. This could be implemented via changes in regulations and licences, or through commercial structures. Part of the scope of the project is to develop and design these complex exchanges, and although there are key differences in comparison to DNO/DSO interactions in EFCC and PP, any learnings highlighted through the lessons learnt review will be taken into account. When it comes to how availability will be managed, and the implication of this for DNO/DSO interactions, there are again some key differences. EFCC and Power Potential systems have the ability for DERs to set their own availability and price in their respective control systems. The most economic and efficient options are then selected operationally by the ESO. There is limited interaction with the DNO, outside of setting parameters within the system. For Black Start from DERs however, we may have a combination of sites and technologies that together offer the service; a DER may combine with a battery or wind farm to achieve the overall block loading capability. This would be need to be assessed by a simple logic (yes/no) matrix, ultimately being communicated to inform the wider GB strategy of what was available on any given day. The industry has robust processes for understanding plant and equipment availability, the NIC project will assess these and detail the most efficient way to make this evaluation. The interactions and exchanges here are disparate in type and scale, however, if there are any opportunities identified as part of the review these will be taken into account during the project. The key to ensuring market interaction with larger numbers of participants is possible is to have a standardised approach that facilitates the partnership approach between DERs and the DNO and clearly lays out the variable electrical requirements needing to be met to deliver the same functional service. A new approach would need to be taken to engage potential providers looking at services such as EMR by using conference style events rather than bilateral meetings. A mechanism for estimating the value of the service will need to be developed to select the best overall proposal, rather than simply the lowest priced one, based upon the service availability and overall capability.

	Further, an appropriate mechanism for procuring and contracting the service will need to be designed and developed in its entirety, to ensure operational requirements are met, and an economic and efficient solution is delivered for the end consumer. The scope of the project includes identifying and developing a future market, and a key component of this will be learning what we can from EFCC and PP. In conclusion, whereas we agree there is learning to be drawn from these projects, and this NIC project looks to capture and apply them to Black Start from DER- we also feel there are plenty of differences that must be taken into account.
Attachments	