

Electricity Network Innovation Competition Full Submission
Supplementary Answer Form

Project: REVISE

Tick if this answer has been provided verbally: ☐

Project code	WPD/EN/NIC/05	Question Number	7
Question date	16 August 2018	Answer date	20 August 2018
Submission section question relates to	N/A		
Topic	(d) Is innovative (ie not business as usual)		
Question	Other than stating the methods have not been implemented before please explain in detail the specific risk NIC funding will mitigate that in your view prevents WPD from implementing this project. Please explain in detail for each of the three methods.		
Notes on question	None		
Answer	<p>Each of the Methods for REVISE has a significant level of innovation and this has been reflected in the risks within the RAID log in Appendix F of the FSP.</p> <p>Section 4.3 of the FSP provides details on why the Project is innovative and has an unproven business case where the innovation risk warrants a trial to demonstrate its effectiveness. The following answers provide further detail on information included within the FSP.</p> <p>Overview</p> <p>The capacity of Distributed Generation connected to the network is expected to double by 2030. This represents a huge challenge for the entire industry and we believe that REVISE will help all DNOs manage this change to the network, assist with the transition to decarbonised networks and maintain network cost-effectiveness. There is a high level of innovation risk associated with REVISE as the Methods are currently at the very early development stages and will require field trials to develop the associated technologies and systems to TRL 8. Innovation funding is therefore key in this instance to providing a well-structured and accountable Project to accelerate the development and trial of these innovative solutions so that we can:</p>		

1. Tackle the immediate problems that have been identified in our FSP in a timescale that realises the predicted benefits; and
2. Implement a trial of suitable scale that will have the ability to demonstrate the benefits of the three Methods.

The following paragraphs detail the specific risks that NIC funding will mitigate for each of the three REVISE Methods.

Advanced Connection Solution

The ACS will be an industry first, ultra-compact, standardised, pre-commissioned connection solution for DG on the 33kV network. It will be a connection Solution that has been designed from the bottom-up to maximise the transfer of low carbon energy from DG, thus preparing the distribution network for the substantial forecast numbers of DG connecting in the coming years. It will provide a significant step towards network decarbonisation which is a key part of government energy policy.

Through our RFI process that was carried out as part of the FSP, we have proven that there is no 'off the shelf' product that meets the design criteria of the ACS, however, we have identified a number of manufacturers with the capability to help design and build an ACS to the required specification through a controlled process with DNO oversight and supervision. NIC funding will facilitate coordination with a range of manufacturers and stakeholders (other DNOs, DG owners/operators) to design and build a product that meets the requirements of all interested parties and can therefore be rolled-out on a GB scale.

Without NIC funding there will be little incentive to transition from existing BAU 'non-firm' connections for DG on the 33kV network on the basis that they are tried and tested and relatively low upfront cost. The continuation of this process will lead to increasing reliance on the customer's flexibility to be disconnected from the network altogether for main circuit maintenance or network faults. With DG capacity set to double by 2030, there will be increasing numbers of DG susceptible to network outages and hence there will be large amounts of low carbon energy that is 'lost' due to connections that aren't optimised for a low carbon design. The process for connecting new DG to network is also not currently standardised and a host of designs and processes are implemented across different DNOs. With NIC funding, this risk is mitigated as we can design and build a standardised ACS with policy and technical specification documents disseminated to all DNOs which will facilitate the GB scale roll-out.

Dynamic Protection System

The protection of future networks which are constantly changing to manage flexibility will become more strenuous if current techniques continue to be used. The DPS Method is critical to facilitating the transition to INR and automated networks of the future whilst maintain a high level of network safety and protection. The TRL for DPS is very low, hence the main risk is that if NIC funding is not awarded the development of DPS design, policies and standards would be reactive rather than proactive. This would lead to significant barriers for the roll-out of INR across GB and hence the benefits of INR will not be realised for the GB customer. We also understand that DPS represents a significant shift in the traditional Methods of implementing

	<p>and managing protection on the network. The DPS Method will not only trial new technologies, but also new philosophies that could be used across GB and other network voltages in the near future. The benefits that DPS will help release are significant, however, as the TRL level is low there are several major risks that need to be managed and controlled during development and which would be mitigated with NIC funding. For example, in a similar way to INR, DPS will require research and development of cybersecurity measures to ensure network security is maintained and consistent across all DNOs for the GB scale roll-out.</p> <p>The DPS Method also has to be integrated with the ACS and INR Methods over a wide network area to be adequately trialled and to understand the interaction with the Methods.</p> <p>Intelligent Network Reconfiguration</p> <p>The development of INR represents a revolutionary change in the way that networks are operated and managed. Distribution networks are traditionally operated in a static mode with reconfiguration occurring in reaction to faults or maintenance either by manual intervention or logic driven automation schemes. However, the operation and control of the network will need to become proactive in the future to ensure that we can extract the most from existing assets and provide the necessary flexibility for existing and new customers.</p> <p>The INR Method will trial a new system that will calculate and implement the optimal network configuration in timescales that cannot be achieved using traditional techniques. Such a system will be necessary to ensure that the network is ready and capable to respond to changes that will happen in the future.</p> <p>Implementation of INR will require a huge step change in skills, thinking and technologies. As such, the development of the system needs to be carefully considered and planned by the industry. If each DNO were to develop the Solution independently, they would encounter the same technical challenges which would lead to higher costs and longer development timescales. With NIC funding we can be proactive in our approach by implementing a controlled trial of the Method which can be rolled-out across GB. The output from the trial will demonstrate significant learning to all DNOs thereby accelerating the implementation of INR and preparing the network for future challenges.</p> <p>As detailed in Appendix D of our FSP, we plan to use NIC funding to engage with a number of manufacturers and consultants who are experts in their field to investigate and develop the technologies required to ensure INR can be integrated on the network. For example, we have allowed for significant research into the cybersecurity requirements that may be necessary for INR.</p>
Attachments	None