

Question No.	From	Proforma section	Criteria	Question	Date question asked	Date response required	Date received	Follow up to Question #
1	NC	A2		Please explain whether the carbon benefits claimed by the project are net of the carbon embedded in the manufacture and construction of the Advanced Connections Solution	07 August 2018	09 August 2018	08 August 2018	
2	MQ	2	Innovative, vfm	What does the Advanced Connection Solution achieve that load air break switches wouldn't, or other similar pole mounted switches.	09 August 2018	13 August 2018	13 August 2018	
3	MQ	2	vfm	How often do you envisage having to change protection settings on any given feeder? Do you have any historic information in this area given the amount of DG you have connected thus far?	09 August 2018	13 August 2018	13 August 2018	
4	MQ	2	vfm	How many permutations exist for INR controlled switching in the 3 trial areas based on the number of NOPs you have and would be expected to keep in these areas.	09 August 2018	13 August 2018	13 August 2018	
5	MQ	2	vfm	What is the expected frequency of INR switching in these? Based on you're your control engineers assessment of the likely impact of increased DG in these areas.	09 August 2018	13 August 2018	13 August 2018	
6	LH	2	Innovative, vfm	Please explain how the ACS is innovative, and delivers something more than or distinct from what could be delivered by load air break switches or other similar pole mounted switches.	14 August 2018	16 August 2018	16 August 2018	2
7	NC	n/a	Innovative	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.	16 August 2018	20 August 2018	20 August 2018	
8	NC	2	vfm	Please state clearly and succinctly, the number of feasible permutations available after the 40 stated in your previous answer was analysed and those that were not feasible were excluded.	16 August 2018	20 August 2018	20 August 2018	4
9				Confidential				
10	EP	K.2.2	VFM	In calculating the benefits case for ACS, it reads like you have taken the product of (installed capacity) x (outage rate) x (LCOE plus profit). This would be applicable if the generator was capable of operating continuously at full output. How have you taken account of the capacity (or load) factor for the DG technology in question, which for onshore wind can be the mid-twenties of percent?	21 August 2018	23 August 2018	23 August 2018	
11	EP	n/a		For the DPS, what comparisons have been made with establishing unit protection as a permanent solution (especially once ACS is available)?	21 August 2018	23 August 2018	23 August 2018	
12	EP	n/a	innovative	Why is INR more valuable than, for example, deploying Electricity North West's C2C on these networks?	21 August 2018	23 August 2018	23 August 2018	
13	EP	2		P5 - the problem – substitution by fossil fuel power- does this relate to national generation, or to temporary mobile generation deployed by WPD?	21 August 2018	23 August 2018	23 August 2018	
14	EP	2	innovative	P11 2.2.1 "Never before on the distribution network" - can you provide either some clear proof, or clarification on the level of novelty?	21 August 2018	23 August 2018	23 August 2018	
15	EP	4		P21 – please explain the NG Optimal Power Flow aspect of this project. It is not clear from the description on this page what status of this tool is, nor who owns or operates it.	21 August 2018	23 August 2018	23 August 2018	
16	EP	n/a		Please explain how the base case cost and the INR cases are comparable. It seems an overly simple solution that one reinforced section releases its full capacity (30MW); will there not be other bottlenecks that mean this is overly optimistic?	21 August 2018	23 August 2018	23 August 2018	
17	CO	4	a) Low carbon/environment and net financial benefits	If rolled out across GB, it is unlikely that all the DNOs will procure from the same suppliers. Has the project team consider the proportion of the project cost that will have to be replicated by each DNO to adapt these Methods to their own networks and their own suppliers?	21 August 2018	23 August 2018	23 August 2018	
18	CO	2	innovative	For Method 1, it appears that conventional equipment will be repackaged for the ACS application. Is that correct or is it also the intention to trial innovative components in the ACS?	21 August 2018	23 August 2018	23 August 2018	

19	CO	4	a) Low carbon/environment and net financial benefits; d) Is innovative	For Method 1, customers would normally opt for the cheapest connection (typically a T) from a cost point-of-view. Why would customer's choose this more complex and costly option and how will the DNO prove that this is the best lifetime cost solution as part of BaU?	21 August 2018	23 August 2018	23 August 2018	
20	CO	Appendix L Technical Description of Project Methods	d) Is innovative	For the DPS, how will back-up protection be provided and if this is also to be provided from a single protective device, has a revised Safety Case been developed and approved?	23 August 2018	28 August 2018	28 August 2018	
21	CO	L.3 Dynamic Protection System	d) Is innovative	For the DPS, in what way will the communications be "optimised"?	23 August 2018	28 August 2018	28 August 2018	
22	CO	L.4 Intelligent Network Reconfiguration	d) Is innovative	How will the INR be integrated in or with the DNO's NMS and how will you ensure this will be easy and cheap for other DNOs to replicate?	23 August 2018	28 August 2018	28 August 2018	
23	CO	L.4 Intelligent Network Reconfiguration	d) Is innovative	For the INR, can you describe how the proposed system will optimise losses, network capacity or network operability. How this optimisation differ from that proposed in other NIC/NIA projects such as UKPN's Active Response.	23 August 2018	28 August 2018	28 August 2018	
24	CO	L.4 Intelligent Network Reconfiguration	d) Is innovative	What is the TRL of the INR? Please provide more detail of the programme to develop the solution and implement it.	23 August 2018	28 August 2018	28 August 2018	
25	CO	L.4 Intelligent Network Reconfiguration	d) Is innovative	It appears that the INR will be standalone system. Why could this functionality not be implemented on the DNO's existing NMS? This would reduce the cost associated with the additional system and its interface with the DNO system, something the NMS already provides.	23 August 2018	28 August 2018	28 August 2018	
26	NC	2	Business case	Please describe in more detail the counterfactual for the three proposed project methods.	30 August 2018	03 September 2018	03 September 2018	
27	NC	Appendix B	Benefits	Method 2 appears to facilitate the delivery of the other two methods. Please provide an updated of each of the benefits calculations showing the benefits of 1 & 3 when the negative benefits for Method 2 are taken in to account.	30 August 2018	03 September 2018	03 September 2018	
28	NC	2	Business case	What proportion of the GB distribution system could each of the three methods be applied to?	30 August 2018	03 September 2018	03 September 2018	
29	NC	2	Robust Methodology	<i>"We have recently published a consultation on proposed reform of network access and future charging arrangements. Please explain the potential impact of these proposals on your submission."</i>	30 August 2018	03 September 2018	03 September 2018	
30	CO			Has the duration and energy output lost due to a. Faults and b. Planned outages been quantified? How are these grouped (connection voltage, generation type, generation output, etc.)?	30 August 2018	03 September 2018	03 September 2018	
31	EP	appendix k	a) Low carbon/environment and net financial benefits.	<i>Please explain why the average of FES carbon intensity figures was chosen rather than any particular scenario. Please comment on the carbon benefits that would be expected if the estimate were based on either Slow Progression (2017 data) or Steady Progression (2018 data)</i>	04 September 2018	06 September 2018	06 September 2018	

32	EP	appendix k	a) Low carbon/environment and net financial benefits;	Please indicate ( <i>approximately</i> ) the ratio of carbon benefits arising from the ACS which are attributable to reducing periods of curtailment (outage) and carbon costs attributable to embodied carbon.	06 September 2018	10 September 2018	07 September 2018	
33	EP		Robust Methodology	Building on question 12 and the discussion at the Expert Panel meeting on 05 September, the approach in Revise does not seem to allow for different design philosophies for the 33kV network, other than the existing one. It also seems that the shift in design philosophy of C2C is not understood, based on the answer to Q12. C2C is a method to obtain more capacity pre fault, not post fault. It does so by converting a radially operated system into a meshed system, and deals with the resulting protection challenges by the intelligence in the network management system (NMS). In other words C2C consciously rejects the design requirement that a protection system must only disconnect unhealthy circuit elements. Instead it allows healthy system to be disconnected, and then use the intelligence of the automatic reconnection sequences in the NMS to restore the healthy circuits. It does this in under three minutes. Given the challenges on ensuring discrimination which method 2 of Revise seeks to resolve, it seems that one relevant counterfactual would be to redesign the network to use the C2C philosophy, thus avoiding the need for DPS. Whilst it is not obvious at all that such an approach will be appropriate for the 33kV networks in question, it is also not immediately obvious why not. There is a broader underlying issue here. Why is it appropriate to simply roll forward historical design philosophies, and then seek to innovate to make them work in radically changed circumstances. The proper counterfactual for Revise should be based on a wider review of design philosophies. Is it possible to reconsider the counterfactual for Revise in the light of this challenge?	13 September 2018	17 September 2018	17 September 2018	12
34	LH	3	a) Low carbon/environment and net financial benefits;	What is the basis of the falling capital cost for ACS?	13 September 2018	17 September 2018	17 September 2018	
35	LH	3	a) Low carbon/environment and net financial benefits;	Please explain the underlying benefit calculations within the submission - where appropriate by providing the calculations and describing any assumptions that informed these calculations.	13 September 2018	17 September 2018	17 September 2018	
36	EP	appendix k	a) Low carbon/environment and net financial benefits;	Please confirm that the answer to question 13 is consistent with the description of the carbon benefit calculation given on page 74.	18 September 2018	20 September 2018	19 September 2018	13

37	CO	K.4.2 Benefits	(g.iii) the robustness of the project methodology, including whether it is technically robust and its outputs are statistically robust.	Please provide worked examples from simulation and/or research studies showing the improvements in plant availability and energy sent out from renewable DG attainable by implementing DPS and INR, compared to procedures and techniques which are presently used. The technologies are at TRL 4, so it is expected that such information should be readily available.	20 September 2018	24 September 2018	24 September 2018	
38				Confidential				
39	EP		innovative	The components to build the ACS are already proven. Your answers imply the innovation in this element of the project only lies in the packaging, control, communication, operation and maintenance of the ACS as a configured substation. Please confirm our understanding, or provide evidence to the contrary.	02 October 2018	04 October 2018	04 October 2018	
40	EP		Robust Methodology	Please provide an explanation of the criteria you believe can be used to prove the effectiveness of INR and how INR will be exercised in the project to prove its effectiveness against the criteria.	02 October 2018	04 October 2018	04 October 2018	
41	EP		Value for money	We understand the innovative nature of the INR: the ACS and the DPS appear, predominantly, to be facilitators for the INR. However; the balance of project costs to the other two methods make up 57% of the project budget (relative to INR which is 35%, the remainder being research and dissemination). Please justify the proportion of costs allocated to the development of each method; there appears to be an enduring benefit of the ACS to generators and the network operator. Therefore, please explain why DUoS customers should fund its development.	02 October 2018	04 October 2018	04 October 2018	
42	EP		Robust Methodology	Please explain the needs case for each method– including the circumstances in which each method would be used rather than the base method. As part of the explanation please explain the proportion of the WPD and GB networks each method would be applied to in 2030 and 2050.	02 October 2018	04 October 2018	04 October 2018	
43	EP		involvement of other project partners and external funding	In relation to partners please explain: why none of your generator supporters (referred to in appendix O) have committed to providing a financial contribution to the development and demonstration of the ACS. The Panel feels such an omission makes it harder to assess how the GB roll-out benefits will be achieved, in the timescale envisaged; The extent to which OEMs have said: they currently have products on the market that will deliver the desired outputs of one or more of the three methods; or they expect to bring products or services to the market that will deliver the desired outputs of one or more of the three methods.	02 October 2018	04 October 2018	04 October 2018	
44				Confidential				
45	EP			Please provide an output of the network modelling setting that indicates how many times the INR would be required to reconfigure the network within the period of a day.	02 October 2018	04 October 2018	04 October 2018	