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	48
Question date	6 Sep 2018	Answer date	10 Sep 2018
Submission section question relates to	DERs – a large and growing opportunity for a Black Start market of dwindling providers		
Topic	a) Low carbon/environment and net financial benefits		
Question	Have you determined the maximum ratio of asynch/synch generation for normal operation in each region? Will this influence the ratio of asynch to synch providers of Black Start services in each region?		
Notes on question			
Answer	Please also see our response to Question 24. We know that with newer technologies it is possible to run a Power Island from a 100% asynchronous source in normal operation. Note that the asynch/synch ratio is different from the ratio of intermittent to despatchable sources. We are also aware of various initiatives and efforts across the world to increase the acceptable level of non-synchronous penetration in normal operation. However, there has not yet been any substantive work done to determine the maximum feasible ratio of asynch/synch generation in an early stage Power Island compared to that for normal operation. We also understand that Black Start and the early stages of restoration present different challenges to normal system operation. As discussed at the first panel interview, international research and experience with microgrids will offer some insight into what is possible. At this time we understand that the maximum asynch/synch ratio possible in each Power Island for Black Start will depend on the specific mix of technologies already installed and a number of factors, including the scope to modify generator protection and control settings between normal and restoration conditions.		

	This is an area that requires further investigation and an open exchange with generation owners/operators and equipment manufacturers on technical capability. This issue highlights the risk and innovation within this project. We do not yet know what is possible and if we were creating a distribution-level Power Island today we would have to be cautious and keep the asynch/synch ratio very low in the early stages. By working through the case studies, exploring what is possible with DER, establishing new coordination techniques, and perhaps specifying new control strategies, we should be able to increase the theoretically achievable ratio and understand any limiting factors.
Attachments	