LCNF Full Submission

Supplementary Answer Form

DNO Name:	SPM	Question Number:	SP028
Question Date:	17 SEP 2010	Answer Date:	21 SEP 2010
Question Topic:			

Original Question No:		Original Answer Date:	
Original Question:			
Original Answer:			

Question:	Provide justification for the installation of a storage device only rated at 150kW?

Answer:	Space is at a premium with Liverpool City and so the approach taken was to limit the physical size and cost of the storage device to the minimum necessary to influence the network power flows in a material way sufficient to demonstrate the role storage can play in future networks. Importantly, modelling of the effects of storage on the LV network will be validated against the measured results. This will then allow larger storage devices to be simulated with confidence to determine optimum strategies for the use of storage to derive network and carbon benefits without the costs and time delays associated with further physical trials. In this way it will be possible to efficiently achieve proof of concept. The rating of the storage device was determined taking into account three inter-related considerations. These are explained below.

	Network It is proposed to connect the storage device to the LV busbars at an HV/LV substation within the trial area. The substation has a single 500kVA HV/LV transformer and the LV network is operated interconnected with three other 500kVA HV/LV substations to form a group of four transformers. The maximum demand on the four transformers is estimated to be approximately 800kVA and the minimum demand is expected to be around 400kVA. Therefore it should be straightforward to measure changes in demand caused by a storage device rated at 100kVA. **Technology** A number of suppliers were approached and evaluated in terms of their capability to provide suitable technology and support. The two main practical storage technologies researched for the trial were flow-cell batteries and lithium-ion batteries. Factors considered were storage capacities (kWh), electrical charge and discharge capacity (kW), efficiency, physical size and cost. This resulted in selecting a supplier that offered a product of 100kW charge/discharge capacity and flow-cell battery energy storage capacity of 150kWh. The product is modular comprising two 50kW units. **Physical** A decision was made to house the energy storage equipment in a container rather than building a permanent structure. This would enable it to be constructed and tested off-site, allow it to be deployed more quickly and provide the opportunity to move it to an alternative location in the future. A search of possible locations to house the installation was made. The main criteria were that it was within the trial network, it had sufficient space to accommodate the container(s) and was sufficiently secure to help avoid vandalism and theft.

Attachments:	