

## Response to DS3 System Services Consultation Paper

I welcome the opportunity of responding to the System Services Consultation Paper in respect of technical aspects.

The definition of the various system services are written from the perspective of conventional plant and are not conducive to the development of new innovative ways of providing such services. I have comments on just two areas of System Services. I have no comments on the remainder

### **Synchronous Inertial Response & Fast Frequency Response**

(5.2.1.1 and 5.2.1.2)

It is clear that RoCoF is a problem and the earlier that additional MW can be provided to the system in response to a dip in system frequency, the greater the effect in reducing RoCoF. The first few seconds are crucial. Synchronous Inertial Response is defined with conventional plant in mind and there is no payment for response in under 2 seconds if the device is not synchronised even though it provides great value to the system in terms of RoCoF. For example, under the existing definition, a flywheel will not be eligible for Synchronous Inertial Response because it is connected to the system via power electronics rather than being directly synchronised. Even though it will respond within 1-2 cycles (20-40ms), it will receive no payment for this. It will only be paid for FFR which starts at 2 sec. There is a gap in the proposed system services with no product covering the ms to 2s range.

I suggest that this gap could be filled in either of two ways

- providing an additional incentive under FFR for responses faster than the 2 sec or
- amending the calculation of the Inertial Response<sup>1</sup> volume by introducing an additional factor which would be a “response time factor” which would be 1 in the case of synchronised plant and falling to zero for plant that responds in 2s e.g. it could be a straight line relationship with response time

$$\text{Response Time Factor} = \frac{2,000\text{ms} - \text{response time (in ms)}}{2,000\text{ms}}$$

### **Steady State Reactive Power**

(5.3.2)

I understand the thinking behind the definition of Steady State Reactive Power and it makes sense for conventional plant. However, flywheels can provide any combination of active and reactive power up to the rating of the facility. The active/reactive power curve is effectively a circle and the current definition of the SSRP product would force the service provider to choose some active power level as its  $P_{\max}$  and it would only be paid for SSRP for the reactive power range at that active power level. That may be reasonable for conventional plant which would often run at its  $P_{\max}$ . In contrast, the flywheel would normally be varying its output just

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<sup>1</sup> Dropping the term Synchronous

above or below zero. Hence it would normally have the capability to provide nearly maximum reactive power, either leading or lagging, which would be far in excess of the range defined above at  $P_{\max}$ .

I suggest that the definition of SSRP be reviewed and comparable specifications be developed which would be appropriate for different types of plant.

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