

## Frequency Response Technical Sub Group Update

20<sup>th</sup> December 2010  
National Grid

- National Grid has presented simulated frequency deviations for a variety of different scenarios discussed previously at the FRWG;
- A synthetic inertia requirement based on a  $df/dt$  characteristic has been postulated. This helps to illustrate the requirement we are trying to meet;
- National Grid has demonstrated that synthetic inertia is required to manage an 1800MW loss to current standards, assuming the current definition of primary response, and under our current modelling assumptions;
- Manufacturers have provided clear feedback on the difficulties of specifying a  $df/dt$  controller which is quick enough, yet is stable when applied to a heavily interconnected power system. Various alternatives have been suggested including a frequency trigger 'one-shot', a delta frequency control and various hybrids incorporating elements of  $df/dt$  and the other methods;
- Some members of the group have provided valuable measurement data which supports this view. Local voltage events can look like frequency deviations as they distort the voltage waveform which would lead to unnecessary triggers and/or instability;
- The Group believes that synthetic inertia will not be quick enough to prevent the operation of ROCOF relays;
- Further National Grid modelling suggests that delivery timescales of 0.5sec or more may be adequate which could substantially reduce the challenge to equipment manufacturers in designing and building synthetic inertia capable equipment;
- The group has requested further clarity on National Grid's modelling assumptions (e.g. "does your frequency responsive plant include wind in frequency sensitive mode?"). National Grid plans to revisit its scenarios based on the load the duration curve, published future plant mix scenarios and a view of plant scheduling issues;
- National Grid plans to examine a variety of different synthetic inertia controller implementations to evaluate their effectiveness and robustness;
- Further debate is expected on a range of issues including concurrent inertia and response delivery and the need for high frequency triggered inertia; and
- The final sub-group meeting is scheduled for the 14<sup>th</sup> January but the extent of the technical analysis still to be performed (which is predicated on the development of assumptions and potential control philosophies) mean that more time will be needed before a report can be delivered. Our current best view of this is February.