

Fault Ride Through: Active Power Recovery



Fault Ride Through: Active Power national grid

Previous Discussion

- A possible modification to the Fault Ride Through performance requirements was discussed at the September GCRP
 - Paper: "Active Power Recovery After Fault Ride Through Events in Respect of Large Power Park Units" by Sigrid Bolik
- The discussion highlighted the mechanical impact on Power Park Unit drive trains of meeting the current requirement of Active Power Recovery within 500ms following a 'short' duration fault

0.1s improvement means ~20% higher loading

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Background to Requirement

The SQSS stipulates criteria for the loss of power infeed to the Transmission System following a secured event

Includes unbalanced or 3-phase faults to earth

- Such faults result in voltage dropping to near zero across large areas of the system
- Any nearby generation which cannot remain connected will be lost in addition to the initial infeed loss
- Active Power recovery from affected generation is required to limit the fall in frequency



Voltage Dip Propagation Example



3 phase fault applied at Walpole 400 kV substation

- Fault Location 0 % Volts
- 0 15 % Volts
- 15 30 % Volts
- 🔲 30 40 % Volts
- 🗖 40 50 % Volts
- 🗾 50 60 % Volts
- 60 70 % Volts
- **70 80 % Volts**
- 🔲 80 90 % Volts

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Background to Requirement

- Active Power Recovery timescale of 500ms was introduced by amendment H/04
- Included in the supplementary changes recommended by Ofgem's consultants as a relaxation from the 'immediate' recovery requirement detailed in consultation
- A delay greater than 500ms was deemed not acceptable due to its impact on frequency during the period up to full active power recovery

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Possible Next Steps

- Recovery period could be reassessed using updated frequency models and assumptions
 - Improved assumptions could suggest better frequency performance and hence a relaxation of the requirement
 - Changes in system inertia assumptions and the potential move to a larger infeed loss act against this
- Assessment could performed as an extension of the modelling work initiated by the Frequency Response Working Group

Recommendations

- National Grid intend to seek views from wind turbine manufacturers on the impact of retaining the current requirement
- GCRP members are invited to seek similar
- National Grid will report to the February 2011 GCRP
- February 2011 GCRP to consider the need to review requirements