

DS3 Advisory Council

RoCoF Work stream

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Increasing the RoCoF standard

- Higher levels of Non synchronous generation may result in higher levels of RoCoF values on the Power System. To ensure the safe operation of the power system the TSOs have –
 1. Engaged with industry to determine if the current generation portfolio is capable of withstanding higher levels of RoCoF. Monthly meetings
 2. Engaged with the DSOs to determine if their Loss of mains (LOM) protection can comply with higher levels of RoCoF

Progress to date

TSOs

- The TSOs are considering an all-island RoCoF standard of 1Hz/s
- Based on a fully integrated power system on the island which will happen when we have a second N-S tie line
- Until the second tie line is in place the TSOs are considering an ROI RoCoF standard of 1Hz/s measured over 500msecs
- This is dependent on a system study with high EWIC imports and high wind. Results to be published July 2012
- Until the second tie line is in place the TSOs are considering an NI RoCoF standard of between 1.5 and 2Hz/s measured over 500msecs
- This will be dependent on a system study considering NI in an isolated situation. Results to be published July 2012

Progress to date

Conventional Generation Position

- All generator owners are concerned that increased levels of RoCoF and increased occurrences of RoCoF may have an impact on generator lifespan and frequency of major overhauls. Some generators are also concerned about the potential for Catastrophic Failure
- Northern Ireland :
 - Some generator owners expect their portfolio to be able to withstand 1.5Hz/s and possibly 2Hz/s (A RoCoF of 2Hz/s will require further study)
- Rol:
 - IPP's: Bord Gais, Endesa, Viridian, Tynagh, Viridian, Dublin bay have indicated a review of their plant would cost €250K per unit and would take 8-12 months per unit.
 - ESB Power Generation (ESB PG) have indicated that a review of their plant will take between 10 and 24months per unit and while costs vary by plant type are broadly in line with the IPP costs. (~€200k/plant)

Progress to date

Renewable Generation Position

- All wind farms are capable of riding through RoCoF of 1Hz/s and in some cases as much as 4Hz/s
- Some wind farms may have LOM protection which may cause the Distribution connected wind farms to trip at low levels of RoCoF (0.4Hz/s)
- 380MW from a potential 453MW Wind farms in NI use vector shift as its Loss of Mains Protection
- These wind farms should not trip for LSI induced RoCoF but could be susceptible to a local transmission fault which could produce a voltage angle shift

Progress to date

DSOs Position

- NIE and ESB will be producing reports on the status of Loss of mains protection settings and capabilities
- This will firstly provide an indication of the capability of the Distribution system to deal with higher RoCoF settings
- If the RoCoF setting can be increased the report will identify the scope of work required to meet this increased capability
- NIE do not own G59 relays, changes to G59 settings will be at the expense of the generator
- ESB provide RoCoF settings to D-connected generation, different technologies have different RoCoF setting
- Wind farms have a 2Hz/s setting but conventional plant will have a 0.6Hz/s setting.
- DSO reports will be available in December 2012

Next steps

TSOs

- The TSOs are concerned that current timelines presented by the DSOs and generators may have an adverse affect on the levels of curtailment of wind generation
- The TSOs will continue to operate the power system with the current system Non-synchronous penetration limit of 50% and this will remain the position for at least another year