

Distribution Code Review Panel

Meeting 64 – 8 June 2017

Rate of Change of Frequency protection changes to deal with increasing system Rate of Change of Frequency due to reduced system inertia and larger maximum loss of infeed (1800MW from 1320MW).

Paper by Code Administrator

Progress and revised Terms of Reference

Background

The Panel will be aware of the long running work in both GC0035 (phase 1) and GC0079 (phase 2) investigating the issues overall system security associated with transmission issues interacting with distributed generation. The original prompt for the work was the recognition of the twin effects of the decreasing inertia on the GB system coupled with the increase in the maximum infeed loss from 1320MW to 1800MW.

The work has been split into two phases, with there being sufficient benefit to require all generation >5MW not to have RoCoF protection set below 1Hzs^{-1} (save for some existing synchronous generation where the requirement is 0.5Hzs^{-1} .) in Phase 1. Phase 2 is considering the benefits of extending the same analysis to all remaining distributed generation

Issues

It has recently become clear that vector shift as an alternative to RoCoF for loss of mains protection fails to discriminate between genuine loss of mains events and the voltage disturbances caused by faults on the transmission system. Hitherto vector shift was seen as a legitimate alternative to RoCoF, although its suitability was a point of investigation in the existing terms of reference for Phase 2. In the light of both the Landulph-Langage incident of May 2016 and analysis undertaken by GC0079 it seems wise to cease the introduction of any new vector shift protection as soon as appropriate modifications to this effect can be made to the DCode. GC0079 now suggests that it should consult on the vector shift issue as soon as possible, with a view to disallowing it as loss of mains protection. This will stop the problems associated with lack of vector shift discrimination increasing as more distributed generation is connected. The question about what steps, if any, to take with existing vector shift protection will be further considered as part of the completion of Phase 2

Separately other work in the industry is reviewing black start preparedness. Whilst such work is considering restoration strategies, communication needs etc, it is appropriate for GC0079 to consider the behaviour of DG fitted with G59 protection and to try to ensure that frequency related aspects of this are appropriately future proof. It might well be, for example, that the extension of 1Hz s^{-1} to all DG is helpful to re-establishing stable power islands as part of Local Joint Restoration Plans. It is intended to liaise with the black start preparedness work being undertaken under the auspices of the Energy Emergency Executive, to consider any interaction with frequency resilience, and to build any resulting implications into the Phase 2 recommendations.

Recommendation

The Panel is asked to

1. Note and discuss the above developments and to approve the revised terms of reference for the WG.
2. Note and endorse the WG's intention to consult immediately on the removal of vector shift as an allowable loss of mains technique.