Abstract

Increased penetration of renewables will require significant regulating reserves, so we need to re-think the operating paradigm “supply follows demand”: that is, we must decouple generation and demand by working with dynamical grid models for load coordination and frequency regulation. So the load will be controlled to meet the variation in renewables. However, using coordinated loads on a large may lead to grid instability if coordinating controller is not properly designed so we always need frequency control on system. Frequency control means maintaining the frequency around network nominal frequency under different condition of generating and consuming. We simulated frequency control in our works on a simple power system network and show how it affects the different buses of the system. It can be seen that any deviation from nominal value of demand or generation leads to fluctuation in system frequency and in our work it is shown that by frequency control can rebalance power and stabilize frequency and nominal frequency of power system can be restored. Our current study is considering different time-scale of dynamic power systems, voltages and power flows, use simulation tool to create instabilities and understand from where they come and how to mitigate their effect through control and also compare the results that we got from simple power system network on more complicated power system network.