

Abstract

When disturbances occur in power grid, monitoring, control and protection systems are required to stop the grid degradation, restore it to a normal state, and hence minimize their effects. However, in wide area power grid resulting from large extension and interconnection with neighbor grids, classical systems based on local independent measurements and decisions are not able to consider the overall power grid disturbances and then they are not able to avoid the blackout. The introduction of the advanced measurement and communication technologies in these systems may provide better ways to detect rapidly these disturbances and protect the overall grid from the propagation of the fast-cascading outages. Indeed, the observability of the wide area power system dynamics becomes feasible through the use of these recent developed technologies. Using wide area real-time synchro-phasor measurement system based on Phasor Measurement Units (PMUs), different types of wide area protection, emergency control and optimization systems can be designed and implemented