Abstract

Complex power systems need better observability and visualization capabilities to handle critical situations effectively. Synchro-phasor measurements provide intra second visibility to power system dynamics and enable faster control actions. A Phasor Measurement Unit (PMU) measures the voltage and current phasors (angle and magnitude) at a bus in a power system. In the literature, many methods have been reported for determining a measurement set for the allocation of PMUs. Most of these methods use conventional optimization techniques involving more mathematical equations, which are generally time-consuming from a computation point of view, especially for large systems under emergency conditions. The operator has to take instantaneous measurements for the quick state estimation. In this paper a simplified approach has been proposed for placing the measuring devices (PMUs) which involves graph theoretical approach only. A linear algorithm is used to minimize the number of PMUs to monitor the entire system by modeling the system with topological observation theory. A relationship was developed between phasors where PMUs are located and unknown phasors of the system. The results can be used as initial assessment for the state estimator. The algorithm was tested on IEEE-14 Bus System.
Fast Initial State Assessment for State Estimator using Optimally Located Phasor Measurement Units

References


Index Terms

Computer Science Algorithms

Keywords

Phasor Measurement Unit Dominant set Systemphasors Synchrophasors Universal Time Coordinated
Phasor Data Concentrator