

Dynamic Parameter Estimation Of Synchronous Generators

Researchers at the University of South Florida have come up with a novel model to estimate a synchronous generator's states and its electromechanical parameters as well as the mechanical power using synchrophasor measurements.

Traditionally, synchronous generator parameters are obtained by manufacturer data sheets and then verified and enhanced by off-line tests. Off-line methods, however, are neither practical nor accurate in most cases.

Decommitting a generator for parameter measuring is not economical for a utility—especially if the specific generator is a base unit. Furthermore, under different loading conditions certain generator parameters may vary slightly and therefore off-line methods may not be accurate enough for certain applications. Finally, the effect of saturation of generator inductances cannot be accounted for in off-line studies.

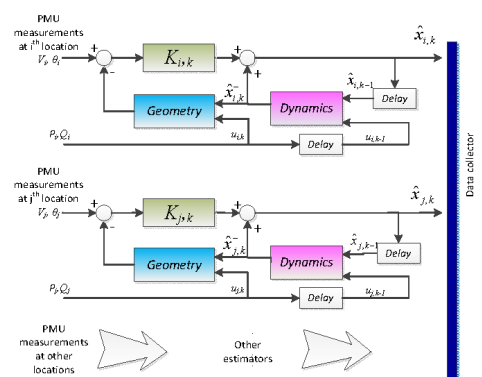
The inventors have designed a new method that makes parameter and state estimation of a synchronous generator simple. The application can perform real-time dynamic estimation for subsystems. The model can estimate the state and parameter related to electro-mechanical dynamics. It gives reasonable estimation for two-state four-parameter estimation and has a limited capability to handle the two-state five-parameter estimation.

Relay manufacturers can incorporate this model into their measurement devices for synchrophasor measurements.

ADVANTAGES:

- Real-time dynamic estimation
- Simplest estimation system for a synchronous generator
- Reasonable estimation for two-state four-parameter estimation
- Reduces computing load

Estimation of Synchronous Generator's States Made Simple!



Kalman filtering technology using PMU data