

POWER SYSTEM DYNAMIC STATE MONITORING AND PROTECTION USING SYNCHRONIZED PHASOR MEASUREMENTS AND FUZZY SYSTEM.

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- **Abstract:** The electricity demand is increasing rapidly due to the modernization of the world. The complexity of operating the power system is increasing due to the introduction of renewable energy sources and decentralized power generation. Due to this, the measurement and monitoring of the power system also became complex. The power system monitoring and measurement data getting from the existed power system monitoring methods like SCADA, and EMS are of slower rate, which is a major drawback in power system monitoring. Thus, the existed power system monitoring methods need to be improving in data collection from the power system and these methods will give limited information about the power system parameters. Improvement in data sensing and the introduction of wireless data communications into power system made it possible for the power system to be centrally monitored and controlled. Phasor measurement with time stamp provides faster rate and coherent real-time data about the power system network that is not possible in the traditional SCADA, and EMS. This led to the concept of a smart grid, WAM and wide area protection. This WAM collects the data from the power system at faster rates like 50-60 samples per cycle from different locations. It is helpful to protect the system in dynamic conditions. The voltage and current signals data from the power system at faster rates are sending it into a software program to calculate the phasor measurements, remaining power system operating parameters like voltage, current, frequency, active and reactive powers. The phasors of voltage and current will give the live representation of the voltage and current signals and these values are helpful to know the complete information about the power flow in dynamic conditions. By adding GPS time stamping to the measured phasor values it is possible to calculate the power flow in the line in a dynamic state. With the dynamic state monitoring system for the control and protection purpose, artificial intelligence is required. For this purpose, a Fuzzy Based Expert System is proposed to take the decisions on the control of the power system during the disturbance conditions in a dynamic state.
- **Keywords:** Electricity, power system, wireless data communications, Fuzzy Based Expert System