Defense Announcement

Decentralized-Inverter Based Reactive Power Compensation for Active Meshed Networks

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This thesis presents an analysis of voltage control and voltage stability in power distribution systems, in the presence of distributed generation (DG). In microgrids, many smaller renewable generators (e.g. wind turbines, photovoltaic, fuel cells, etc.) and energy storage units are interfaced through power electronic inverters. Dynamic response of voltage and frequency under events such as faults or load and/or transmission line switching, may lead to instability in the interconnected micro-grids. These inverters are programmable to work as a source or sink of reactive power. Hence, the dynamic stability can be achieved with the help of localized, fast responding VAR-capable inverters for either providing or absorbing necessary reactive power. The main prospect of injecting reactive power from distributed and localized power sources are to better manage resources, minimize losses, lower costs and offer a better service to the costumers.