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Renewable energy based distributed generation system with fault ride through capabilities

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Being the key to economic development, energy demand across the world is growing regularly which necessitates the increased generation of electrical energy. Increasing power demand, huge transmission and distribution losses, environmental protection while ensuring the reliable supply of quality power have forced the generation of electrical energy by using renewable energy near the consumer. The generated energy may be connected to the grid at low voltage distribution system or it may be consumed in isolation. This generation may use single or combination of more than one type of sources of energy-wind and solar energy are most promising and richly available renewable energy sources across the globe. An optimal and effective management of these sources can improve quality and reliability of power with substantial reduction of the generation cost. Conversion of these energies into electrical energy involves the use of power electronic converters while the conventional power plants involve synchronous generators. These converters are expected to stay connected to the grid for a particularly during the grid disturbances. The converters and generators are expected to stay connected to the grid for a particular duration during grid faults as specified by different grid codes. A suitable Fault Ride Through (FRT) control strategy can avoid tripping of generators during the voltage dips on the grid. This control strategy can limit the converter current by suitably controlling the power flow. The FRT control strategy can suppress the double frequency ripples of power in case of unsymmetrical grid faults. Additionally the strategy ensures suitable reactive power injection for better grid support.

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