Lmmn based adaptive control for power quality improvement of grid intertie wind-pv system

Abstract:- A new topology comprising of wind turbine driven by Doubly Fed Induction Generator and solar photovoltaic (PV) array for renewable energy is proposed in this work. The inputs for the proposed system parameters such as variable wind speed solar insolation. The project is energy management system for micro grid using Hybrid energy systems. The speed variations are absorbed by back to back converter. The converters are Utility Grid side Converter (UGC) and Generator side Converter (GC) with a common dc link, the solar PV arrays is connecting directly. In order to maintain constant voltage to the DC grid using Landsman converter with Artificial Neural Network based MPPT algorithm. To achieve grid synchronization using hysteresis current controller. PV arrays are connected to the DC bus through Landsman converter to simulate DC sources. The results of PV system using the LMMN based adaptive control method integrating the ANN based MPPT method. A DFIG wind generation system is connected to AC bus to simulate AC sources. A battery with bidirectional DC/DC converter is connected to DC bus as energy storage.

Existing Method:- The ever-growing energy demand and emphasis on clean energy have solar and wind based renewable power generations system. Between solar and wind energy systems, the solar energy systems are widely found at distribution level as they require little or no maintenance and the solar panels can be installed on almost any roof, as well as on the ground. Therefore, many households and commercial places are being powered by solar power [1]. The solar power generating systems make use of power electronics based dc-dc and dc-ac converters to transform the dc voltage generated by the solar panels into an usable ac voltage [2]. The power electronic converters are controlled to operate the solar panels at maximum power points.

Propose Method:- In our proposed system configuration of the hybrid system is shown in Figure 1 where various AC and DC sources and loads are connected to
the corresponding AC and DC networks. The AC bus of the hybrid grid is tied to the utility grid. The AC and DC grids have their corresponding sources, loads and energy storage elements, and are interconnected by a three phase converter. In the proposed system, PV arrays are connected to the DC bus through Landsman converter to simulate DC sources. A DFIG wind generation system is connected to AC bus to simulate AC sources. A battery with bidirectional DC/DC converter is connected to DC bus as energy storage. A variable DC and AC load solar panel alters. A capacitor C is added to the PV terminal in order to suppress high frequency ripples of the PV output voltage. The bidirectional DC/DC converter is designed to maintain the stable DC bus voltage through charging or discharging the battery when the system operates in the autonomous operation mode.

**Advantages:** A wind generation system consists of doubly fed induction generator with back to back AC/DC/AC PWM converter connected between the rotor through slip rings and AC bus. The AC and DC buses are coupled through a three phase transformer and a main bidirectional power flow converter to exchange power between DC and AC sides. The transformer helps to step up the AC voltage of the main converter to utility voltage level and to isolate AC and DC grids.

**Application:** As the higher order harmonics can be filtered easily, the filtering requirements are minimized. The Insulated Gate Bipolar Transistor (IGBT) is a three-terminal power semiconductor device, noted for high efficiency and fast switching. Since it is designed to rapidly turn on and off, amplifiers that use it often synthesize complex waveforms with pulse width modulation and low pass filters. Back-to-back voltage source convertor is used in doubly fed induction generator which controls the grid and rotor currents. By controlling the rotor currents by the converter it is possible to adjust the active and reactive power fed to the grid from the stator independently of the generators turning speed. Rotor circuit is controlled by a power electronics converter, the induction generator is able to both import and export reactive power.