Wind farm power smoothing with HVDC link

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The growing need for electrical energy being limited fossil fuel resources and increasing environmental pollution, make use of clean energy sources in the electricity industry to the inevitable. Wind energy is one of the most important renewable energy that its use is growing very fast. Therefore, comprehensive study of wind energy potential problems and ways to solve them is important and necessary. One of these problems is related to unpredictable and fluctuating nature of wind; Which leads to unwanted fluctuations in electrical power output of wind turbines. This can create problems in the power grid frequency control.if increases the level of wind energy penetration, raditional producers and stabilizing the grid frequency control will be facing a problem. One way of connecting large wind farms in remote areas to the network is using transmission lines (VSC-HVDC) lines, in other words is HVDC Light. It is considered Due to the unique control features.The system studied in this thesis is based on wind farms permanent magnet Synchronous Generator that is connected to the power grid By HVDC transmission line. In this thesis is taken into consideration fluctuations in the power output of the wind turbine connected to PMSG and This control methods provided that will lead to smoothing power output. The concept of vector control is used for Speed control of permanent magnet synchronous generators for wind farm and DC voltage level Controls of the grid side converterThe proposed system is simulated in MATLAB/Simulink.

Keywords : key words Wind Turbine, Wind Farm, VSC, HVDC, HVDC Light, PMSG