A Large Scale Single Stage Fuel Cell Based Distributed Generation System for Different Distributed Generation Applications

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Abstract*—In this paper, the use of a single stage power conditioning system with the proton exchange membrane fuel cells to form a large scale single stage fuel cell based distributed generation system has been studied. This proposed large scale single stage system consists of fuel cell power plant model, sinusoidal pulse width-modulation two-level 4-wire inverter followed by an LC filter. Two capacitors have been used to split the DC bus and to create the fourth line. The fuel cell based distributed generation system model has been simulated in MATLAB/SIMULINK environment. The results obtained from simulating the system under different loading conditions and under transient conditions have been displayed and discussed.*

Keywords*— Proton exchange membrane fuel cells, DC/AC inverter, fuel cell based distributed generation, PI controller, sinusoidal pulse width-modulation technique*