This paper presents the method for the usage of PWM inverters for various different and accurate applications. As it is the great requirement for processes to provide the best and accurate results in different working conditions. So for their uninterrupted working in that field, there is need to employ the device which works during the failure of power supply system. By keeping this requirement at high priority, the method for generating pure sinusoidal voltage waveform at the PWM inverter output is described in this paper. Harmonics are the basic and old problem which continue to affect the performance of the power systems in various applications depending upon the types of loads (linear & non-linear) [1]. Thus, there is need to limit such kind of distortion. So, in this paper Fuzzy logic control mechanism is presented for the modifications in PWM inverter of the controllers' structure. Results of the MATLAB/Simulink simulation show that inverter output current is in sinusoidal waveform and in
phase with line voltage, and current harmonics are in the limits of international standards (}