

ABSTRACT

Cascaded H-bridge multilevel inverter (CHBMLI) is the most popular topology for high power and high voltage applications. There are total $4m$ numbers of power electronic switches in a CHBMLI having m numbers of modules ($m \geq 2$). Because of higher number of switches; the possibility of faults in switches is more. A CHBMLI is said to be “reliable”; if it continues delivering output voltage; even after fault in switches of $m-1$ number of modules. A fault-tolerant structure is proposed for CHBMLI having 3 modules. Wherein; any 1 out of 3 modules gets faulty; the remaining 2 healthy modules will continue delivering output voltage with the same amplitude and the same voltage level as in case of normal operation having all the 3 modules are healthy. When any 2 out of 3 modules get faulty; the remaining 1 healthy module will continue delivering output voltage with the same amplitude and reduced voltage level. In this way, the proposed fault-tolerant structure of CHBMLI improves the system reliability by preventing the breakdown of the whole system till at least 1 module is healthy.