As an increasing amount of converter-based generation on power electronics is connected to power systems, transmission system operators (TSOs) are revising the grid connection requirements to streamline the connectivity of the devices to maintain security of supply. Converter-based generation can behave significantly different from the traditional alternators under grid faults. In order to evaluate the potential impact of future converter-based power systems on protective relays, it is necessary to consider diverse current control strategies of voltage source converters (VSC) under unbalanced faults as the performance of converters primarily depends on their control objectives. In this paper, current control strategies of VSC under unbalanced faults for short circuit power provision are reviewed in two groups, namely power-characteristic-oriented and voltage-support-oriented control strategy respectively. As the fault current provided by converters should be restricted within secure operation limits considering semiconductor capabilities, converter current limit issue is also discussed.