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Analysis of Fault Characteristics of Converter in VSC-HVDC

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The voltage source converter is an important part of VSC-HVDC (Voltage source converter based high voltage direct current) system which has low over-voltage and over current bearing ability and thus prone to various faults. In this paper, based on the VSC-HVDC system PSCAD/EMTDC simulation model, the mathematical model of DC voltage and current fluctuation component caused by AC single-phase break fault is established. Also, the mathematical model of fault AC current on both-side converters is built. Based on the research mentioned above, two VSC fault harmonic transfer patterns is studied. It is proved that n-th harmonic positive sequence on AC side of one-side fault converter will lead to (n-2)-th harmonics negative sequence and n-th harmonics positive sequence on the other VSC, and that n-th harmonics negative sequence on AC side of the fault converter will cause n-th harmonics negative sequence and (n+2)-th harmonics positive sequence on the other VSC.

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