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## Current sensor reduction approach of voltage source converter (HVDC) system with power quality control using tuning methods

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An improved power quality 12-pulse voltage source converter is proposed for high voltage direct current (HVDC) system. In this project, the proportional integral (PI) tuning methods are used, and controller gains are selected by comparing Ziegler Nichols and Tyreus Luyben methods for different transient conditions. To minimize the complexity of the system, one current sensor is reduced. The proposed method is designed, modeled and simulated in MATLAB-Simulink environment under various transient conditions such as load perturbation, voltage sag, tapped load fault at points-of-common coupling (PCC) and single-line to ground (SLG) fault at input AC mains while restricting the total harmonic distortion (THD) at alternating current (AC) mains current within specified limits of the IEEE 519 standard. The simulated waveforms and power quality results are presented to validate the effectiveness of the proposed control.

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