# Regulating and Equalizing dc Capacitance Voltages in Multilevel STATCOM

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**Abstract**

Because of the high MVA ratings, it would be expensive to provide independent, equal, regulated DCvoltage sources to power the multilevel converters which are proposed for STATCOMs. DC voltagesources can be derived from the DC link capacitances which are charged by the rectified AC power. This paper addresses two control issues: (1) regulation of the DC capacitance voltages and (2) their equalization. Equalization is necessary (i) to ensure the even sharing of voltage stresses in the gate-turn-off thyristors (GTOs), and (ii) to prevent the degradation of total harmonic distortion (THD) factors, as all harmonic elimination strategies depend on equal voltages in their assumptions. The strategies considered are: (a) the fundamental frequency method, and (b) the sinusoidal pulse width modulation method. Digital simulations are used to confirm the feasibility of the control methods

**Keywords:** PWM invertors; capacitance; harmonic distortion; power capacitors; power convertors; power systems; static VAr compensators; thyristor convertors; voltage control