Unified Power Flow Controller (UPFC) Based on Chopper Stabilized Multilevel Converter

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Abstract

As the diode-clamped, multilevel converter has been found to have attractive features for STATCOM application, there is interest in extending it to UPFC application by using multilevel converters as the series and the shunt converters. Unfortunately, as is demonstrated in this paper, the DC voltages at their DC links, are inherently unstable. Faced with this impasse, a solution is sought in a system of local feedback controlled Class B choppers to equalize the DC. A laboratory experimental model establishes the feasibility of the proposal. Digital simulations show that current ratings in the choppers need be only 10% of the current ratings in the converters. The chopper cost is estimated as 1% of the cost of the multilevel converters

Keywords: choppers (circuits); feedback; load flow control; power semiconductor diodes; static VAr compensator