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عنوان مقاله:

Introducing The Low Switching Frequency Space Vector Modulated Multi-Modular Three-Level Converters For High Power Applications

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خلاصه مقاله:

High power force-commutated series-connected voltage source converters have recently found applications in SVC and DC transmission station, high power drive systems and reactive power compensation units. Requirements for very high system efficiency, and also relatively slow highpower switching devices, GTO's, impose low switching frequencies, typically a few hundred HZ, modulation techniques. Multi-module power converter structures have been proposed to establish a reconciliation between low switching frequency and high quality output voltage. Recently, the introduction of multilevel converter concept, has added impetus to this line of research and multimodule three level inverter structures become feasible. Individual converter units in multi-module converter can be switched either by PWM or by single pulse switching techniques. Among all various pulse width modulation strategies developed for multi-level converters, space vector modulation, because of its flexibility to optimize switching patterns, and to balance the dc side capacitor voltages, stands out. Despite itsadvantages, no proposal has been reported yet to demonstrate how SVM can be employed in multimodular multi-level high power structures. This paper presents a novel low switching frequency SVM in conjunction with a modified delayed sampling principle for generating the switching patterns of individual GTO-based three-level units of a multi-module converter structure. Alternative switching strategies are compared with respect to their impact on output voltage spectrum, switching frequency and THD. This paper also introduce necessary changes in proposed low frequency switching strategies that make them well appropriate for capacitor voltage balancing too. The modified proposed strategies are discussed. The validity of the .proposed switching schemes has been verified by simulation

کلمات کلیدی:

Space Vector Modulation, Three-level Inverters, Delayed Sampling Technique

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