IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, October 2024

Design and Implementation of Modular Multi-Level Converter Based HVDC System for Grid Connection

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Abstract: *This paper examines Modular Multilevel Converters (MMC) for harnessing power from offshore wind farms. MMCs use many simple Voltage Source Converter (VSC) submodules, enabling high-voltage and high-power applications. They offer faster response times and lower harmonic distortion than traditional two-level VSCs. The paper addresses modelling challenges due to numerous switching devices and discusses the development of Cascaded Two-Level (CTL) converters, which improve output voltage quality. Overall, the study highlights advancements in MMC technology that enhance HVDC transmission capabilities.*

Keywords: Modular Multilevel Converter (MMC), HVDC transmission, Voltage Source Converter (VSC), Converter Control, Mathematical modelling