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Voltage margin control for offshore multi-use platform integration

This paper discusses a multiterminal direct current (MTDC) connection proposed for integration of offshore multi-use platforms into continental grids. Voltage source converters (VSC) were selected for their suitability for multiterminal dc systems and for their flexibility in control. A five terminal VSC-MTDC which includes offshore generation, storage, loads and ac connection, was modeled and simulated in DigSILENT Power Factory software. Voltage margin method has been used for reliable operation of the MTDC system without the need of fast communication. Simulation results show that the proposed system was able to maintain constant dc voltage operation during fluctuations in the generation and changes in the demand. Moreover, it was able to secure power supply to passive loads during loss of a dc voltage regulating terminal and to perform a dispatch scheme where it is possible to buy, sell or store energy attending to the price in the electricity market.

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