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ANALYSIS AND PERFORMANCE OF MVDC DISTRIBUTION SYSTEM WITH ESS FOR WIND AND SOLAR ENERGIES

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ABSTRACT

In distributed power systems, the integration of renewable energy sources and DC loads are increasing day by day. Medium Voltage Direct Current (MVDC) is a modern concept to meet the DC demandwith high reliability and feasibility. A simulation model of hybrid configuration merging both MVDC and ESS (Energy Storage System) for solar and wind energies have been modelled, simulated, and compared. To get a bidirectional power flow, the ESS is connected to a Bi-directional DC-DC converter. In this paper, the comparative performance of the MVDC distribution network integrated with ESS is evaluated for solar and wind energy sources. The study's main contribution is obtaining a coordinated operation of MVDC and ESS, which performs via a supervisory control scheme that defines the set-points for the control loops in each converter.

KEYWORDS: *MVDC, Grid, Distribution, ESS, VSC, Bi-directional DC-DC converters*

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