

1. A Two-Stage Optimization Method of Dynamic VAR Compensation for Multi-infeed HVDC-AC Receiving System

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Abstract: The influence of High Voltage Direct Current (HVDC) on AC-DC system is not considered in most optimization problem of dynamic var compensation. A two-stage optimization method of dynamic var compensation for multi-infeed HVDC-AC receiving system is proposed in this paper. The first stage is partition. In partition stage, a sensitivity-controlled partition method for AC-DC system var compensation is proposed considering the influence of the multi-infeed HVDC system. The second stage is optimization. In optimization stage, for each area, there are three steps: 1) the trajectory violation integral index considering HVDC commutation failure is analyzed; 2) the optimization objective considering both the voltage trajectory sensitivity integral and economic cost factors is established; and 3) the imperialistic competitive algorithm (ICA) is improved and utilized to solve the optimization problems of the dynamic VAR compensation allocation for each sub-area. Finally, the applicability and effectiveness of the proposed method are illustrated using the Guangdong power system as test system. © 2018 IEEE.

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