
With the fast development of technologies of renewable generations and distributed energy resources, the distribution grids become more and more active, and the coordinated transmission and distribution management (CTDM) becomes more important. Under the CTDM framework, this paper proposes a multi-level overload relief method for transmission network using the capability from an active distribution network (ADN). When an overload event occurs at the transmission network, an appropriate operational scheme for ADN is selected by the proposed multi-level method. Then, the ADN takes the decided operational scheme and adjusts its operational status (i.e., reconfiguring its network topology, transferring loads to Microgrids and shedding the controllable loads) to contribute to load curtailment from the ADN side and further alleviate overload in the transmission network. Numerical case studies show that the proposed method can alleviate the overload of transmission network and maintain the normal operation of the ADN, which demonstrates a promising application for CTDM.

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