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Abstract-

High scale integration of renewable energies has led power system towards a new set of challenges that have increased the complexity of cost optimization problem. Moreover, forecast errors in the prediction of wind, PV and load affect the accuracy of optimization. Therefore, cumulants and Gram–Charlier method have been proposed for solving probabilistic load flow (PLF)-based optimal transmission switching (OTS) for large-scale integration of renewable energy. The cumulants method has been used for forecast error evaluation in order to improve the accuracy of the proposed method. Moreover, Gram–Charlier method has been utilized for PLF-based OTS evaluation due to its fast convergence. In this paper, the simultaneous optimization of generation dispatch and network topology for PLF-based OTS has been investigated. Wind farm along with PV has been considered for large-scale integration. The proposed approach has been applied on IEEE 118 bus system with renewable integration. The results depict that the proposed approach is quite useful for large-scale power systems.

Index Terms- Renewable energy sources · Wind power generation · Optimal transmission switching · Probabilistic load flow · Cumulants · Gram–Charlier expansion

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