## عنوان مقاله:

Optimal Allocation of Wind-based Distributed Generationand shunt Capacitor with Considering Power Loss Reduction

## محل انتشار:

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## خلاصه مقاله:

In this paper, an optimal method for allocation of wind based distributed generation considering reliability improvement and power loss reduction is accomplished. Due to remarkable fluctuation of wind speed, power generation based on wind energy is associated with someamount of uncertainty. Therefore, researches in case of generation in presence of wind based DGs need a competent modeling. To this end,this study is based on a probabilistic approach; wherein, at the first step, hourly data of wind speed is gathered for a desired place over a year'speriod of time and then output powers of wind turbine corresponding to wind speeds are evaluated using output power of wind turbine versuswind speed relation with the respecting to the type of wind turbines. At the next step, a fuzzy C-mean clustering is employed to classify outputpower of wind turbine in several levels as well as to obtain relevant center and probability of each cluster. In a similar approach, suchclustering has been exerted for variant load demand of distribution system. Then, Correlation of generation and load demand is formed as aprobabilistic matrix to provide a complex Generation-Load Model. Power losses of network using distribution power flow is determined.Then, using concept of math expectation and Generation-Load matrix, total power losses of network have been calculated. A Non-DominatedSorting Genetic Algorithm has been accomplished to attain optimal capacity and location of wind based turbines and shunt capacitorconsidering and power loss reduction. Proposed method is applied to an IEEE 33-bus .test system. Obtained results demonstrate applicability ofthe proposed method

## کلمات کلیدی:

Wind-based DG; Allocation; Distribution Systems; Uncertainty;NSGA-II