

Strategic maintenance scheduling of an offshore wind farm in a deregulated power system

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Abstract-

This paper proposes a model for strategic maintenance scheduling of offshore wind farms (SMSOWF) in a deregulated power system. The objective of the model is to plan the maintenance schedules in a way to maximize the profit of the offshore wind farm. In addition, some network constraints, such as transmission lines capacity, and wind farm constraints, such as labor working shift, wave height limit and wake effect, as well as unexpected outages, are included in deterministic and stochastic studies. Moreover, the proposed model provides the ability to incorporate information from condition monitoring systems. SMSOWF is formulated through a bi-level formulation and then transformed into a single-level through Karush-Kuhn-Tucker conditions. The model is validated through a test system, and the results demonstrate applicability, advantages and challenges of harnessing the full potential of the model.

Index Terms- bi-level optimization; maintenance scheduling; deregulated power system; offshore wind farm

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