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Congestion Management in Transmission Systems with Large Scale Integration of Wind Energy

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SUMMARY

This paper presents a new approach of congestion management with network based measures, market based measures and generation management in wind farms for transmission system with large scale integration of wind energy. The congestion management problem is solved using a genetic algorithm based approach, that enables to combine network based measures, market based measures and generation management in order to avoid congestions. In doing so, the power system requirements are assessed with network security algorithms like the AC-load flow calculations for the base case, the (n-1)-security calculations or the short circuit calculations. Additionally to the mentioned possibilities of congestion management, the paper presents an approach of energy management using energy storage systems to enhance the collaboration between wind farm operators and TSO in order avoid congestions on the grid.

KEYWORDS

congestion management, genetic algorithm, topological actions, network based measures, redispatch, wind energy, energy storage

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