

Distribution Grid State Assessment for Control Reserve Provision Using Boundary Load Flow

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Abstract

With the increasing expansion of wind and solar power plants, these technologies will also have to contribute control reserve to guarantee frequency stability within the next couple of years. In order to maintain the security of supply at the same level in the future, it must be ensured that wind and solar power plants are able to feed in electricity into the distribution grid without bottlenecks when activated. The present work presents a grid state assessment, which takes into account the special features of the control reserve supply. The identification of a future grid state, which is necessary for an ex ante evaluation, poses the challenge of forecasting loads. The Boundary Load Flow method takes load uncertainties into account and is used to estimate a possible interval for all grid parameters. Grid congestions can thus be detected preventively and suppliers of control reserve can be approved or excluded. A validation in combination with an exemplary application shows the feasibility of the overall methodology.

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