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Preventive analysis and solution of overloads in the Spanish electricity market

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Abstract-

The technical feasibility of a power generation dispatch in competitive electricity markets consists of not having any overloaded equipment, not only in case of normal operating condition, but also when any contingency established in the security criteria occurs. In addition, bus voltages should be within their limits. This paper describes an optimization method to analyze and solve the transmission overloads that arise in each hourly scenario of the Spanish power system, after the electricity market has been cleared. Overloads are solved in the Spanish market by increasing and decreasing generation of connected units, and by connecting off-line ones. The proposed method comprises three steps: (a) contingency analysis, (b) preventive active dispatch and (c) classification of generation redispatch. The performance of the method is illustrated using an actual example of the Spanish electricity market.

Index Terms- Power system dispatch, security assessment, congestion management, optimal power flow, unit commitment

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