

# Connecting the intraday energy and reserve markets by an optimal redispatch

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## Abstract-

Electricity markets based on simple bids provide a very high degree of transparency and simplicity. However, simple bids fail to capture many well-known characteristics of generating units and, therefore, the responsibility for obtaining feasible schedules is transferred to market participants. The purpose of this paper is to help the generating utility to automatically analyze the last energy program cleared in the market and, in case this program is technically unfeasible, to provide an alternative schedule by redispatching the generating units. This is achieved by formulating an optimization problem where the objective is to find the cheapest and feasible instantaneous power trajectory of each generator, trying to minimize the differences between its hourly average values and the last energy program. As the objectives of the utility can vary during the day, three different models are presented. Two of them are formulated as a joint energy and reserve dispatch in order to take into account possible commitments acquired in the ancillary services market of AGC regulation. In this sense, a novel approach for considering discontinuous ancillary regulation curves is proposed. Some numerical examples are included to illustrate the essential features of the models.

**Index Terms-** Ancillary services, feasibility, instantaneous

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