

Energy Management of a Micro-grid Considering the Uncertainties of Generation and Demand

Zainal Salmanzadeh*,

Recently, the concept of Microgrids (MG) has been introduced in the distribution network. Microgrids are defined as small power systems that consist of various distributed micro generators that are capable of supplying a significant portion of the local demand. Microgrids can operate in grid-connected mode, in which they are connected to the upstream grid, or in isolated mode, they are disconnected the upstream grid and the local generators are the only source of power supply. In order to maximize the benefits of the resources available in a microgrid, an optimal scheduling of the power generation is required. Renewable resources have an intermittent nature that causes uncertainties in the system. These added uncertainties must be taken into consideration when solving the generation scheduling problem. This research studies the scheduling of power generation in a microgrid that has a group of dispatchable and non-dispatchable generators. The operation of a microgrid during grid-connected mode is analyzed under variable demand profiles. Mixed integer linear programming (MIP) model for the day-ahead unit commitment problem in a microgrid is proposed. Uncertainty handling techniques are integrated in model. The model is solved using the General Algebraic Modeling System (GAMS). In order to study the operation of the microgrid and to evaluate the effects of uncertainties and spinning reserve requirement on the microgrid's expenses 3 cases are examined

Keywords : Micro-grid, Optimal operation, Distributed generation, Multi-scenario stochastic model, Curtailable load.

[Islamic Azad University, Rasht Branch - Thesis Database](#)
[دانشگاه آزاد اسلامی واحد رشت - سامانه بانک اطلاعات پایان نامه ها](#)