

Optimal Scheduling of Microgrid with Renewable Energy Sources Considering Islanding Constraints

Prakruti Shah¹ and Bhinal Mehta²

School of Engineering & Technology, Navrachana University, Vasna-Bhayli Road, Vadodara-
391410 Gujarat, India

Abstract

The paper proposes a method for microgrid optimal scheduling with renewable energy sources considering islanding constraints. The main purpose of the paper is to reduce the total operating cost of microgrid which includes the purchased energy cost from main grid and total local resources generation cost in grid-connected mode, and generation cost of local generators and renewable sources in islanding mode. The problem of microgrid optimal scheduling is classified into two subproblems like grid-connected mode as a main master problem and islanding mode as a subproblem. The results of grid-connected mode microgrid optimal scheduling are examined in the next subproblem of islanding mode for possible islanding. For the feasible islanding, if sufficient generation is not available the scheduling results will be revised by suitable islanding Bender's cuts. The suitable islanding Bender's cut will revise generator unit scheduling, energy storage scheduling and adjustable load scheduling. Numerical simulation has been carried out by using MATLAB software to exhibit the effectiveness of the proposed method of optimal scheduling of microgrid with renewable energy sources.

Keywords: microgrid; subproblems; MATLAB software