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عنوان مقاله:

Enhanced Scheme for Allocation of Primary Frequency Control Reserve Based on Grid Characteristics

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خلاصه مقاله:

Balancing between demand and supply of grids is the most important task of the power systems operators and control systems. Otherwise, the possibility of frequency instability and severe damages to equipment are present. Primary frequency control (PFC) is the first and main control action in the grid in front of the active power imbalance disturbances. In this paper, the effects of the spinning reserve characteristics and the grid dynamic parameters, on PFC performance and maximum frequency decline (frequency nadir), are investigated. Then, a comprehensive equation is presented to determine the maximum frequency deviation after a large power imbalance in the grid. This equation considers all effective factors such as volume and speed of the primary frequency reserve (PFR), grid inertia constant, grid load level, and the frequency-dependent loads. The correctness of the presented equation is verified through different simulations. Finally, a comprehensive scheme is proposed for the primary frequency control reserve allocation in the grid, in the form of a few equations and instructions.

کلمات کلیدی:

Primary Frequency Reserve, Inertia Constant, Load Damping Constant, Maximum Frequency Drop, Generation Ramp Rate

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