



INVESTIGATION OF EFFICIENCY OF POWER BALANCING IN THE POWER SYSTEM OF THE VARIABLE SPEED PUMPED STORAGE UNIT

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ABSTRACT

This article analyzes possibilities of effective usage of variable pumped storage unit in power system. The main function of variable pumped storage unit is power compensation while ensuring power reliability and quality of voltage and frequency parameters. In this investigation exciter and control system of pumped storage unit is evaluated as well as structure and functional peculiarities in generator and pump regimes. Probability of oscillations in power system is being modeled with integrated wind plant parks and reaction of variable pumped storage unit to entailed power variation. Iterations, statistical and numerical integration methods were applied for establishing parameters and characteristic. The criteria of effective reliability, voltage and frequency parameters and security indexes are determined.

Keywords: variable pumped storage unit, exciter and control system, generator regime, pump regime, quality of voltage, quality of frequency