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SIMULATION MODEL AND CONTROL ALGORITHM FOR ISOLATED HYDRO-WIND POWER SYSTEM

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Abstract

A new configuration of a three-phase isolated hydro-wind system (IHWS) is considered. The IHWS contains a driven by a regulated hydraulic turbine synchronous generator with electromagnetic excitation, an induction generator with a short circuit rotor driven by an unregulated wind turbine, compensating capacitor bank and regulated dump load fed through an active rectifier. An algorithm for two-level stabilization of the electric frequency in the system is developed. Using the developed simulation model of IHWS, a mathematical simulation of the IHWS electromechanical processes has been performed for a load step and fixed wind speed. The simulation results showed the stable operation of the system in steady-state operating modes and tracking the reference electric frequency levels. References 17, figures 5, table 1.

Key words: isolated hydro-wind system, synchronous generator, induction generator, active rectifier, dump load, frequency controller.

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