Study of Dynamic Simulation and Control of a New Parallel Hybrid Electric Power System

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ABSTRACT

This thesis primarily focus on studying dynamic simulation and controlling design of a new parallel hybrid electric power system, which is included innovative power integration and distribution mechanism. Any power source can be individually actuated by electric motor and internal combustion engine. Two input power sources can be integrated into a powerful source via power integration and distribution mechanism, thus resulting in twice the output energy and obtaining necessary tractive power. In the dynamic simulation, the dynamic equations of whole new parallel hybrid electric power system can be established by using Matlab/simulink, and design the fuzzy logic controller of this system. The analysis and dynamic simulation of this new hybrid electric power system has been established in detail. It can be found by the way of dynamic simulation and energy management strategy, this fuzzy logic controller can be suitable to adjust two power sources of electric motor and internal combustion engine. The internal combustion engine can maintain an optimum state under various operating conditions. The change of each power source can also reach good operation and decrease the unnecessary power loss. The research results of this thesis have already completed a new set of low fuel consumption, low pollution and high performance hybrid electric power system.

Keywords : Parallel Hybrid Electric Power System ; Power Integration Distribution Mechanism ; Fuzzy Logic Controller ; Energy Management Strategy ; Dynamic Simulation

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