Ship energy storage electric propulsion

A dynamic state of charge (SoC) balancing strategy for parallel battery energy storage units (BESUs) based on dynamic adjustment factor is proposed under the hierarchical control framework of all-electric propulsion ships, which can achieve accurate power distribution, bus voltage recovery, and SoC balance accuracy. In the primary control layer, the arccot function ...

As shown in the Fig. 1, the dredger is mainly composed of two diesel generator sets, two mud pumps, two propellers and other loads.The super capacitor and the battery constitute a composite energy storage device, which is connected with the DC bus through a multi-port DC / DC converter [8,9,10].The stability and economy of the electric propulsion ship ...

Shipboard electric propulsion systems experience large power and torque fluctuations on their drive shaft due to propeller rotational motion and waves. This paper explores new solutions to address these fluctuations by integrating a hybrid energy storage system (HESS) and exploring energy management (EM) strategies. The HESS combines battery packs with ...

Abstract Flywheel energy storage has been widely used to improve the ground electric power quality. This paper designed a flywheel energy storage device to improve ship electric propulsion system power grid quality. The practical mathematical models of flywheel energy storage and ship electric propulsion system were established. Simulation ...

The propulsion systems of hybrid electric ship output and load demand have substantial volatility and uncertainty, so a hierarchical collaborative control energy management scheme of the ship propulsion system is proposed in this paper. In a layer of control scheme, the traditional perturbation algorithm is improved. Increasing the oscillation detection mechanism ...

This strategy coordinates impulse loads and propulsion loads to reduce the impact of impulse load changes on the power quality of all-electric ship power systems. In order to meet the control and management requirements of energy storage systems on hybrid electric propulsion ships, a hierarchical control strategy was proposed . This strategy ...

The practical mathematical models of flywheel energy storage and ship electric propulsion system were established. Simulation research on the effect of ship electric propulsion system power quality, made by flywheel energy storage, was completed by using the software Matlab/simulink. We have done a lot of simulation experiments on sudden load ...

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