

Dynamic simulation of marine SOFC power plant

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Abstract

Solid Oxide Fuel Cell (SOFC) systems are a potent technology to reduce greenhouse gas and pollutant emissions from ships. A model has been developed for an SOFC, genset, and battery power plant. The dynamic model simulates the behaviour of the powerplant components over time, which include electric and thermal balance, part-load behaviour, degradation effects and energy management. A case study of a large cruise ship is used to evaluate the developed model on different hybridisation scenarios. The results indicate the possible emission reduction and emphasize the need for scaling SOFC systems to high-power marine power plants.