

Modeling and Simulation of Diesel-Powered Solid Oxide Fuel Cell System for Auxiliary Power Units Application

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Auxiliary Power Units applications is expected to be first fuel cell penetration in the market of heavy-duty truck and luxury vehicles because there is a good fit between APU requirements and fuel cell system characteristics in terms of efficiency, load requirement, and physical size and weight. And among various types of fuel cell, solid oxide fuel cell is considered the most favorable for application of fuel cell based APU due to several advantages, such as no need for any water management system and higher efficiency than PEMFC. In this study, dynamic model of SOFC was constructed for the prediction of their normal and transient operating conditions. And then the electrochemical performance of the cell is analyzed for several operating conditions to find optimal operating window in the corresponding application.