

Abstract

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Utilization of alternative marine fuels for gas turbine power plant onboard ships

Marine transportation industry is undergoing a number of problems. Some of these problems are associated with conventional marine fuel-oils. Many researchers have showed that fuel-oil is considered as the main component that causes both environmental and economic problems, especially with the continuous rising of fuel cost. This paper investigates the capability of using natural gas and hydrogen as alternative fuel instead of diesel oil for marine gas turbine, the effect of the alternative fuel on gas turbine thermodynamic performance and the employed mathematical model. The results showed that since the natural gas is categorized as hydrocarbon fuel, the thermodynamic performance of the gas turbine cycle using the natural gas was found to be close to the diesel case performance. The gas turbine thermal efficiency was found to be 1% less in the case of hydrogen compared to the original case of diesel.