46ESS-61: Marine Propulsion Systems

GEORGIOS KYROU

The aim of this paper is to evaluate the feasibility of using combined gas turbine cycles as potential prime movers for large ships, like, large cargo vessels (containers, tankers and bulk carriers) or fast ferries and military ships. The majority of these ships, nowadays, are powered by high thermal efficiency and low investment cost slow-speed two-stroke diesel engines. However, due to stricter regulations introduced by the International Maritime Organisation (IMO) for 2020 which limit the production of CO_2, NO_x and SO_x emissions, a new interest for the development of gas turbine based plants for marine applications has arisen. The focus of the review involves the effects of intercooling, reheating and recuperation on the thermal efficiency and performance of gas and steam turbines. Furthermore, the advantages and disadvantages of gas turbine plants over diesel engines for marine applications are outlined while a comparison between the two in terms of marine fuels, pollutant emissions and running costs is taking place. Finally, various concerns of international shipping on human health and environment are discussed.