عنوان مقاله:

Thermo-economic optimization of an Organic Rankine Cycle coupled with the main engine of an oil tanker

نویسندگان:

Hamid Reza Nasiri - *graduate of K.N. TOOSI University of Technology and has a master's degree in Energy Systems Engineering from Petroleum University of Technology*

Gholamreza Salehi - *is with Petroleum University of Technology, Abadan, Iran*

Majid Eshagh Nimvari - *is with the Technical and Engineering Faculty, Amol University of Special Modern Technologies, Amol, Iran*

Fariborz Ahmadi Daryakenari - *is a graduate of K.N. TOOSI University of Technology and has a master's degree in Energy Systems Engineering from Petroleum University of Technology*

خلاصه مقاله:

This paper analyses the application of Organic Rankine Cycle for production of power using the exhaust gas of the main engine of a fuel tanker. The chosen ship is equipped with a main engine, producing 31.6 megawatts of power that is running and usable for waste heat recovery purposes for 90 percent of the year(sailing period). Sensitivity analysis is carried out to understand the effects of variations in different parameters of the cycle (with six different working fluids) on power production, exergic efficiency, irreversibility, cost and savings and other characteristics of the system. For the proposed ORC layout, multi objective thermoeconomic optimization has been conducted to achieve a design that minimizes thermodynamic inefficiencies and cost of the systemsimultaneously. The results indicate that utilization of ORC can lead to 430000 US dollars of saving due to less fuel consumption of auxiliaries and reduction in CO_2 penalties. The results also indicate that the application of ORC has a period of return of 5 years which means that the proposed design is economically justified.

کلمات کلیدی:

ORC, Thermo-economic Optimization, Waste Heat Recovery

لینک ثابت مقاله در پایگاه سیویلیکا:

https://civilica.com/doc/1167129