

Performance analysis of supercritical organic Rankine cycle system with different heat exchangers design configuration

ABSTRACT

Recovering waste heat is one of the solutions found to lessen the emission and fuel consumption. Waste heat is heat energy produced by internal combustion wasted to the atmosphere. However, these low grade waste heats are not sufficient enough in generating power due to insufficient low temperature. Thus, to recover these waste heat, Organic Rankine Cycle (ORC) system is one of the beneficial exhaust heat recovery technologies which is widely used for the applications of low grade heat recovery rather than conventional Rankine cycle. This paper provides analytical study of the performance of supercritical ORC using exhaust aircraft engine as waste heat in order to find the best design configuration for the ORC system. The results show that supercritical ORC with superheater achieved higher net power output and thermal efficiency compared to the ORC system with preheater.

Keyword: Organic Rankine cycle; Preheater; Supercritical; Superheater