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Exergetic modelling of oil-fired steam boilers

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Abstract

This study is aimed at investigating the performance variables and potential of energy savings in oil-fired industrial steam boilers. Operational parameters of steam boilers using low pour fuel oil (LPFO) and diesel were used to compute thermodynamic properties of materials streams which were in turn used to evaluate exergetic parameters to determine input variables used in modelling of exergetic variables. A parametric analysis of entropy effects, and steam temperatures on exergetic performance of boilers was conducted at various reference state ambient conditions. The overall exergetic quantities, exergetic destruction and efficiencies were modelled and respective coefficient of correlation and standard errors determined. Developed models in this study could be employed to analyse and estimate exergetic performance parameters of oil-fired steam boilers in order to enhance their efficiencies and reduces energy wastage.

Biography

Idehai O. Ohijeagbon is currently a Lecturer in the Department of Mechanical Engineering, University of Ilorin, Nigeria. His specialization is in energy studies and sustainability.