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## Utilizing Philippine Calatrava coal-diesel oil mixture (CDOM) as alternative fuel for industrial steam generator

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### Abstract

The fast depletion of fuel oil and the continuous increase in the demand for power is a global issue. In the Philippines, the demand for diesel oil is expected to increase significantly in a 20-year period as projected by the Department of Energy. In line with the Philippine Government's thrust to lessen the dependence on imported energy, the agenda for the search for alternative fuel is highly prioritized. Thus, this paper presents the results of the study on performance analysis and efficiency test of a diesel oil fired industrial steam generator using Philippine Calatrava coal-diesel oil mixture (CDOM) as alternative fuel. A computer program was developed in HyperText Markup Language (HTML<sup>®</sup>) and JavaScript<sup>®</sup> to aid the computation of the adiabatic flame temperature from the governing system of equations based on the heat interaction between CDOM fuel, combustion air and products of combustion to determine the most desirable

alternative fuel. Actual experimentation for the determination of CDOM fuel properties was also conducted to verify the alternative fuel selected through theoretical calculations. Results showed that the CDOM fuel with a particle size passing 75  $\mu\text{m}$  ( $\sim$ 200 mesh) sieve having a proportion of 5% pulverized coal–95% diesel oil and 10% pulverized coal–90% diesel oil could be handled throughout the test with no degradation of the industrial steam generator. The steam generator efficiency using diesel oil is close to the steam generator efficiency using both CDOM fuels.



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## Keywords

Coal–diesel oil mixture (CDOM); Alternative fuel; Performance and efficiency test; Industrial steam generator

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