



## **Energy and Exergetic Analysis of a Regenerative Rankine Cycle with Feed water Heaters**

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**Abstract:** This paper presents the energy and exergy analysis of a 500 MW steam power plant operating under a regenerative Rankine cycle with one open and three closed heaters. Some case studies were developed with the help of Aspen HYSYS® 7.2, in order to study the behavior of the energy efficiency and exergy cycle under changes of the high pressure (32 MPa-40 MPa) and high temperature (600°C - 800°C), medium pressure (2 MPa-8 MPa), Medium temperature (300°C-600 ° C) and low pressure (5 kPa-100 kPa), resulting in a nominal operating conditions a thermal efficiency of 46.2%, a second law efficiency of 79% and a 79.05% of irreversibility in the boiler and superheater regarding the exergy supplied.

**Keywords :** exergy, energy, irreversibilities; Regenerative Rankine cycle, efficiency.

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