

***Analysis of Turbine Heat Rate on Steam Power Generation System at PT.  
POMI Unit 3 Paiton***

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***ABSTRACT***

*World and national energy needs always increase every year. Electrical energy that is used continuously is not produced naturally just like that so a reliable power plant is needed. Indonesia in fulfilling national energy needs is dominated by coal-fired power plants with a percentage of 56.4%. Turbine heat rate analysis at coal-fired steam power plants is expected to provide data on heat flow rate and turbine efficiency so that it can be a reference material in maintenance and repair so that the plant is able to work more optimally and efficiently. This research aims to determine the heat rate value in steam turbines and determine the effect of heat rate on turbine efficiency. This research uses a quantitative descriptive approach where descriptive looks for characteristics of a phenomenon and quantitative has data in the form of numbers and is usually presented statistically. Data including generator output power, mass flow rate, pressure, and temperature in each generation state are used to find the enthalpi value and finally used to calculate the turbine heat rate and turbine efficiency. Calculations are carried out on several variations of power load generation, which were 610 MW, 550 MW, 500 MW, 450 MW, 400 MW and 350 MW. The highest heat rate value was obtained at a load of 350 MW which was 8,521.3 kJ / kWh and the highest efficiency at a load of 610 MW was 44.27%. The value of the turbine heat rate is inversely proportional to the efficiency of the tubin where the higher the turbine heat rate, the smaller the efficiency. In order to improve turbine performance can be done by maintenance and repairs to components so that generation performance is maintained.*

***Keywords:*** Turbine, Heat Rate, dan Efficiency