

**Analisis Energi Pada Sistem Pembangkit Listrik Tenaga Uap Studi Kasus di  
PLTU PT.POMI Paiton Jawa Timur. (Energy Analysis on Steam Power System  
(Case Study in PT.POMI Paiton East Java PLTU))**

*Bayu Rudiyanto as chief counselor and Michael Joko Wibowo as a member  
counselor*

**Mohammad Taufik**

Study Program of Renewable Energy Engineering  
Majoring of Engineering  
Politeknik Negeri Jember  
mohammadtaufik719@gmail.com

**ABSTRACT**

*Energy analysis of steam power plant systems PT. POMI Unit 3 PLTU Paiton East Java is based on the first thermodynamic law. Energy analysis is carried out on the main components of PT.POMI Unit 3 which includes Boilers, High Pressure Turbines / HPT, Intermediate Pressure Turbines / IPT, and Low Pressure Turbines / LPT), Condensers, Condensate Pumps (CP), Low Pressure Heaters (LPH), Daerator, Boiler Feed Pump (BFP), High Pressure Heater (HPH). Energy analysis provides information on energy losses for each component with the largest energy loss occurred in the LPT A that is 505637.613 kW, then followed by LPH of 530013,811 kW, condenser of 365898,946 kW, HPH of 2571113,971 kW, BFP 72992,952 kW, boiler of 61763,6365 kW, and condenser of 365898,946 kW, HPH of 2571113,971 kW, BFP 72992,952 kW, boiler of 61763,6365 kW, and condenser of 365898,946 kW, HPH of 2571113,971 kW, BFP 72992,952 kW, boiler of 61763,6365 kW and Daerator of 3657,8,946 kW; 15447.73 kW. While the efficiency of each component of Boiler, CP, LPH 4, LPH 1B, Daerator, HPH 6A, HPH 7A has efficiencies above 90% in turbines of 67.25%. condenser of 13.96%. BFP of 72.59%. LPH and HPH of 64.95% and 89.60%. Nett Plant Heat Rate value from PLTU Unit 3 with a variation of load of 50%, 74 and 87% obtained results that decrease with increasing load where at 50% load NPHR value is 10489.23143 kJ / kWh, at load 74% NPHR value is 10212.44755 kJ / kWh, and at 87% load the NPHR value is 10089,52966 kJ / kWh. These results indicate the lower the value of the Nett Plant Heat Rate, the more reliable and efficient the generating unit is in operating, because the heat energy needed to produce electrical energy of 1 kWh is getting smaller.*

**Keywords :** *Analysis Energy. Efficiency, Nett Plant Heat Rate*