Exergy Analysis of Steam Power Plant at Unit 5 of PT. YTL Jawa Timur .

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Abstract

Exergy analysis of steam power plant at PT. YTL Jawa Timur unit 5 based on first and second laws of thermodynamics. The exergy flow and exergetic efficiency are calculated at several plant components like Boiler, HTP, IPT, LPT, Deaerator, Condensor, HPH, LPH, CEP dan FWP. The exergy of steam fluid that discharged from Boiler is 970.288 *kW and used for produce power electricity 610.000 kW. Overall power plant exergetic efficiency is 65,36%. Sankey diagram shows exergy losses at each component in the power plant. Boiler, Condensor, Turbine, LPH, HPH, Pumps, dan Deaerator losses are 1677003 kW (17,28 %), 738122 kW (7,61 %), 152894 kW (1,58 %), 111881 kW (1,15 %), 470520 kW (4,85 %), 193494 kW (1,99 %) and 1081771 kW (11,15 %) and exergy total that can be produced power electricity is 5276259 kW (54,39 %) from exergy total into system. Boiler produce the largest exergy loss from the system of more 1677003 kW or (17,28 %). The Optimization results which is done by varying the Boiler output pressure obtained that the largest efficiency is 94,04 % at pressure 41 bar.*

Keywords *:PLTU, Exergy, Irreversibility, Optimization.*