

ANALISIS KINERJA PEMBANGKIT LISTRIK TENAGA PANAS BUMI KAMOJANG UNIT 4 DENGAN MEMVARIASIKAN TEKANAN *STEAM RECEIVING HEADER*

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INTISARI

PLTP Kamojang Unit 4 merupakan salah satu pembangkit listrik yang memanfaatkan energi panas bumi dan menghasilkan daya listrik terbesar di Kamojang, sehingga perlu dilakukan analisis termodinamika terhadap kinerja sistem PLTP Kamojang Unit 4 untuk mengetahui kondisi operasi dan optimal kinerja PLTP Kamojang Unit 4.

Analisis termodinamika kinerja sistem PLTP Kamojang Unit 4 pada kondisi operasi dapat dilakukan dengan menggunakan analisis eksergi dan didapatkan efisiensi eksergi PLTP Kamojang Unit 4 sebesar 18,22 % dengan daya turbin yang dihasilkan sebesar 59480 kW dan rugi-rugi eksergi terbesar dialami oleh kondensor sebesar 23,20 %. Selain itu, analisis variasi tekanan *steam receiving header* terhadap daya yang dihasilkan turbin menunjukkan daya turbin optimal PLTP sebesar 59483 kW pada tekanan *steam receiving header* sebesar 10,10 bar. Hasil daya turbin analisis termodinamika kinerja PLTP Kamojang Unit 4 kondisi operasi menunjukkan hasil yang hampir sama dengan hasil daya turbin optimal dari analisis variasi tekanan *steam receiving header* dan mengalami kenaikan 3 kW, sehingga dapat dikatakan bahwa kinerja sistem PLTP Kamojang Unit 4 pada kondisi operasi sudah sangat mendekati kondisi optimal dari kinerja PLTP Kamojang Unit 4.

Kata kunci: efisiensi eksergi, daya turbin, tekanan *steam receiving header*, panas bumi.

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PERFORMANCE ANALYSIS OF THE UNIT 4 KAMOJANG GEOTHERMAL HEAT POWER PLANT WITH VARIOUS STEAM RECEIVING HEADER PRESSURE

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ABSTRACT

Kamojang geothermal power plant unit 4 is one of the power plants that utilizes geothermal energy and produces the largest electrical power in Kamojang, so thermodynamic analysis needs to be done on the performance of the Kamojang geothermal power plant unit 4 system to determine the operating conditions and optimal performance of the Kamojang geothermal power plant unit 4.

The thermodynamic analysis of the performance of the Kamojang geothermal power plant unit 4 system in operating conditions can be carried out using exergy analysis and the exergy efficiency of Kamojang geothermal power plant unit 4 is 18.22% with the turbine power generated at 59480 kW and the largest exergy loss experienced by the condenser of 23.20%. In addition, analysis of steam receiving header pressure variations on the power generated by the turbine shows the optimal turbine power of the Kamojang geothermal power plant unit 4 of 59483 kW at the pressure of the steam receiving header of 10.10 bar. The results of the turbine power thermodynamic analysis of the performance of Kamojang geothermal power plant unit 4 operating conditions show results that are almost the same as the results of optimal turbine power from the analysis of steam receiving header pressure variations and experience a 3 kW increase, so it can be said that the performance of the Kamojang geothermal power plant unit 4 under operating conditions is very close to the optimal conditions of the performance of the Kamojang geothermal power plant unit 4.

Keywords: exergy efficiency, turbine power, steam receiving header pressure, geothermal.

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