

ABSTRAK

Regenerative Air heater termasuk peralatan dalam sistem udara bakar *Boiler* Pembangkit Listrik Tenaga Uap (PLTU) yang bekerja menyerap panas hasil pembakaran utama selain sistem air dan uap. *Regenerative Air heater* pada PLTU Serang 1000 MW unit #2 mengalami beberapa kali gangguan pada tahun pertama pengoperasian. Adanya indikasi tidak stabilnya beban pada elemen penukar panas yang ditandai dengan adanya fluktuasi beban motor penggerak *Air heater*. Pada penelitian akan dianalisis dampak beberapa gangguan tersebut terhadap kinerja *Air heater* melalui perhitungan dan perbandingan antara kinerja *Air heater* pada saat masa *commissioning*, sebelum pelaksanaan *Maintenance* dan Setelah Pelaksanaan *Maintenance*. Analisis akan dilakukan dengan perhitungan manual menggunakan metode *American Society of Mechanical Engineers - Performance Test Code 4.3* (ASME– PTC 4.3), dimana kinerja *Air heater* yang dihitung antara lain *Air heater Leakage*, *gas Side Effectiveness*, *X-Ratio* dan *Air Side Pressure Drop*. Diharapkan akan diketahui perbandingan antara data masa *commissioning* terhadap data sebelum *Maintenance* menunjukkan perbedaan kinerja *Air heater* untuk dihitung dampaknya terhadap kinerja pembangkit dengan menggunakan referensi dari *Electric Power Research Institute (EPRI)*. Dari hasil penelitian, didapatkan bahwa selama masa operasi setelah *commissioning* terjadi perubahan kinerja *Air heater* berupa peningkatan *Air heater leakage* sebesar 2,9%, penurunan efektivitas *Air heater* 1,9%, peningkatan *air pressure drop* sebesar 1,05 inch-H₂O dan berkontribusi untuk menaikkan NPHR sebesar 5,1145 kkal/kWh. Sedangkan setelah pelaksanaan *Maintenance*, perubahan kinerja *Air heater* adalah penurunan *Air heater leakage* sebesar 1,54%, peningkatan efektivitas *Air heater* 2,38%, penurunan *air pressure drop* sebesar 0,89 inch-H₂O dan berkontribusi terhadap penurunan NPHR sebesar 3,5977 kkal/kWh.

Kata kunci : *Regenerative Air heater*, Kinerja *Air heater*, Efisiensi Pembangkit.

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ABSTRACT

Regenerative Air heaters include equipment in the Steam Power Plant (PLTU) Boiler combustion air system which works to absorb heat from the main combustion in addition to the water and steam systems. The regenerative Air heater at PLTU Serang 1000 MW unit #2 experienced several problems in the first year of operation. There is an indication of unstable load on the heat exchanger element which is indicated by fluctuations in the load of the water heater drive motor. In this research, the impact of several disturbances on the performance of the Air heater will be analyzed through calculations and comparisons between the performance of the Air heater during the commissioning period, before Maintenance and after Maintenance. The analysis will be carried out by manual calculations using the American Society of Mechanical Engineers - Performance Test Code 4.3 (ASME- PTC 4.3) method, where the Air heater performance calculated includes Air heater leakage, gas Side Effectiveness, X-Ratio and Air Side Pressure Drop. It is hoped that the comparison between the commissioning period data and the data before Maintenance will show differences in Air heater performance to calculate the impact on plant performance using references from the Electric Power Research Institute (EPRI). From the research results, it was found that during the operational period after commissioning there was a change in the performance of the Air heater in the form of an increase in Air heater leakage of 2.9%, a decrease in Air heater Effectiveness of 1.9%, an increase in air pressure drop of 1.05 inch-H₂O and contributed to increasing NPHR by 5.1145 kcal/kWh. Meanwhile, after implementing Maintenance, changes in Air heater performance were a decrease in Air heater leakage by 1.54%, an increase in Air heater Effectiveness by 2.38%, a decrease in air pressure drop by 0.89 inch-H₂O and contributed to a reduction in NPHR of 3.5977 kcal/kWh.

Key word : *Regenerative Air heater, Air heater Performance, Power Plant Efficiency*

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