

ANALISIS KINERJA PEMANAS AWAL UDARA B SEBELUM DAN SESUDAH OVERHAUL PADA VARIASI BEBAN UNIT 3 PLTU INDRAMAYU

FERDYNAND AGUSTINUS SITANGGANG, 2020-12-026

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ABSTRAK

Air Preheater (APH) merupakan peralatan pemulihan panas yang memanfaatkan energi panas gas buang untuk menaikkan temperatur udara pembakaran sebelum masuk ke boiler. Kinerja APH dipengaruhi oleh berbagai kondisi operasi, antara lain tingkat pembebanan unit, air leakage, kondisi seal dan elemen pemanas, excess air, kualitas bahan bakar, sootblowing, serta kondisi instrumen pengukuran. Penelitian ini bertujuan menganalisis perubahan indikator kinerja Air Preheater (APH) B sebelum dan sesudah overhaul pada variasi beban operasi Unit 3 PLTU Indramayu. Penelitian menggunakan pendekatan kuantitatif observasional dengan memanfaatkan data historis operasi Distributed Control System (DCS) pada kelompok beban 213 MW, 254 MW, dan 295 MW. Data dikelompokkan berdasarkan periode sebelum dan sesudah overhaul, selanjutnya dilakukan penyaringan kualitas data dan analisis pada kondisi operasi dengan tingkat pembebanan yang relatif setara untuk mengurangi pengaruh perbedaan kondisi operasi terhadap hasil perbandingan. Hasil analisis menunjukkan bahwa nilai efektivitas APH B pada periode sesudah overhaul lebih tinggi dibandingkan dengan periode sebelum overhaul pada seluruh kelompok beban yang dianalisis. Pada beban 213 MW, efektivitas tercatat sebesar 90,23% sebelum overhaul dan 91,32% sesudah overhaul. Pada beban 254 MW, efektivitas tercatat sebesar 91,12% sebelum overhaul dan 91,32% sesudah overhaul, sedangkan pada beban 295 MW nilai efektivitas sebesar 91,38% sebelum overhaul dan 93,17% sesudah overhaul. Secara keseluruhan, rata-rata efektivitas APH B pada periode sebelum overhaul sebesar 90,91%, sedangkan pada periode sesudah overhaul sebesar 91,94%, dengan selisih sebesar 1,03 poin persentase. Hasil pengamatan pada variasi beban juga menunjukkan kecenderungan nilai efektivitas yang lebih tinggi pada pembebanan yang lebih besar, dengan nilai tertinggi sebesar 93,17% pada kelompok beban 295 MW periode sesudah overhaul, meskipun pola perubahan tersebut tidak bersifat linier pada setiap kelompok beban. Berdasarkan hasil tersebut, kondisi operasi APH B pada periode sesudah overhaul menunjukkan nilai efektivitas yang cenderung lebih tinggi dibandingkan dengan periode sebelum overhaul.

Kata kunci: Air Preheater, efektivitas, overhaul, beban operasi, PLTU Indramayu.

ANALYSIS OF THE PERFORMANCE OF AIR PREHEATER B BEFORE AND AFTER OVERHAUL ON LOAD VARIATIONS OF UNIT 3 OF COAL-FIRED POWER PLANT INDRAMAYU

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ABSTRACT

An *Air Preheater* (APH) is a heat-recovery device that utilizes thermal energy from flue gas to increase the temperature of combustion air before it enters the boiler. APH performance is influenced by various operating conditions, including unit load, air leakage, seal and heating-element conditions, excess air, fuel quality, sootblowing, and the condition of measurement instruments. This study aims to analyze changes in the performance indicators of *Air Preheater* (APH) B before and after the overhaul at various operating loads of Unit 3 at the Indramayu Coal-Fired Power Plant. A quantitative observational approach was employed using historical operating data obtained from the *Distributed Control System* (DCS) at load groups of 213 MW, 254 MW, and 295 MW. The data were classified into pre-overhaul and post-overhaul periods, followed by data-quality screening and analysis under relatively comparable load conditions to reduce the influence of differences in operating conditions on the comparison results.

The results show that APH B effectiveness during the post-overhaul period was higher than that during the pre-overhaul period at all analyzed load groups. At 213 MW, the effectiveness was 90.23% before the overhaul and 91.32% after the overhaul. At 254 MW, the effectiveness was 91.12% before the overhaul and 91.32% after the overhaul, while at 295 MW, the effectiveness was 91.38% before the overhaul and 93.17% after the overhaul. Overall, the average effectiveness of APH B was 90.91% during the pre-overhaul period and 91.94% during the post-overhaul period, representing a difference of 1.03 percentage points. Observations across the load groups also indicate a tendency toward higher effectiveness at higher unit loads, with the highest value of 93.17% recorded at the 295 MW load group during the post-overhaul period, although the pattern was not linear across all load levels. These results indicate that APH B operating conditions during the post-overhaul period were associated with generally higher effectiveness values than those observed during the pre-overhaul period.

Keywords: Air Preheater, effectiveness, overhaul, operating load, Indramayu Coal-Fired Power Plant.