ANALISA PENGARUH PENAMBAHAN PIPA AIR DAN PIPA *ECONOMIZER* PADA *BOILER* VERTIKAL PIPA API KAPASITAS 100 KG/JAM TERHADAP KAPASITAS UAP YANG DIHASILKAN

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ABSTRAK

Masalah pada *boiler* ini adalah selama proses destilasi, uap yang dihasilkan tidak berlangsung secara continyu, dengan tekanan 1 bar, uap bertahan sekitar 2 menit, sehingga proses destilasi serai wangi kurang optimal. Selain itu, waktu pemanasan *boiler* juga cukup lama, yaitu 95 menit hingga mencapai suhu 100°C. Tujuan penelitian ini adalah menganalisis pengaruhnya terhadap waktu pemanasan, lama uap bertahan, konsumsi bahan bakar, dan efisiensi *boiler*. Penelitian ini dilakukan menggunakan metode kuantitatif dengan pendekatan eksperimen. Hasil pengujian menunjukkan bahwa durasi pemanasan sebelum modifikasi 45 menit, setelah penambahan *economizer* 40 menit, penambahan pipa air 36 menit, dan setelah penggabungan pipa air dan *economizer* 33 menit. Ketahanan uap sebelum modifikasi 4 menit, setelah penambahan *economizer* 2 menit 62 detik, dengan penambahan pipa air tanpa *economizer* 4 menit 42 detik, dan setelah penggabungan pipa air dan *economizer* 5 menit 20 detik. Konsumsi bahan bakar kayu sebelum modifikasi 33,2 kg, dengan penambahan *economizer* 29,5 kg, penambahan pipa air 27 kg, dan setelah penggabungan pipa air dan *economizer* 25,4 kg. Efisiensi yang dihasilkan sebelum modifikasi adalah 66,6%, setelah penambahan *economizer* 69,8%, penambahan pipa air 74,5%, dan setelah penggabungan pipa air dan *economizer* 81,7%.

‘Kata kunci : *Boiler*, *boiler* pipa air, *economizer*, *boiler* pipa api.

ANALYSIS OF THE EFFECTS OF ADDITIONING WATER PIPE AND ECONOMIZER PIPE ON VERTICAL BOILER FIRE PIPE CAPACITY 100 KG/HOUR TO CAPACITY OF STEAM PRODUCED

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ABSTRACT

The problem with this boiler is that during the distillation process, the steam produced is not continuous, with a pressure of 1 bar, the steam lasts for around 2 minutes, so the citronella distillation process is less than optimal. Apart from that, the boiler heating time is also quite long, namely 95 minutes to reach a temperature of 100°C. The aim of this research is to analyze its effect on heating time, steam retention time, fuel consumption and boiler efficiency. This research was conducted using quantitative methods with an experimental approach. The test results show that the heating duration before modification is 45 minutes, after adding the economizer 40 minutes, adding the water pipe 36 minutes, and after combining the water pipe and economizer 33 minutes. Steam resistance before modification was 4 minutes, after adding the economizer 2 minutes 62 seconds, with the addition of a water pipe without an economizer 4 minutes 42 seconds, and after combining the water pipe and economizer 5 minutes 20 seconds. Wood fuel consumption before modification was 33.2 kg, with the addition of the economizer 29.5 kg, the addition of the water pipe 27 kg, and after combining the water pipe and economizer 25.4 kg. The resulting efficiency before modification was 66.6%, after adding the economizer 69.8%, adding the water pipe 74.5%, and after combining the water pipe and economizer 81.7%.

'Key words: Boiler, water pipe boiler, economizer, fire pipe boiler.