

**ANALISIS EFISIENSI *ELECTROSTATIC PRECIPITATOR*
TIPE *ONE STAGE* BERDASARKAN *HIGH VOLTAGE DC* DAN
VOLUMETRIC FLOW RATE FLY ASH DENGAN STUDI KASUS
PLTU UNIT 1 PELAKSANA PEMBANGKITAN TELUK SIRIH,
PAINAN, SUMATRA BARAT**

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INTISARI

Belum maksimalnya kinerja *electrostatic precipitator* dalam menangkap *fly ash* hasil pembakaran batubara mengakibatkan terjadinya peningkatan kadar pencemaran lingkungan disekitar PLTU Teluk Sirih. Terdapat beberapa faktor yang mempengaruhi kemampuan *electrostatic precipitator* dalam melakukan penangkapan terhadap *fly ash* diantaranya *ukuran fly ash*, nilai *high voltage DC*, nilai *volumetric flow rate*, jarak antara *collecting plate electrode*, dan luas *collecting plate electrode*. Penelitian ini difokuskan pada *high voltage DC* dan *volumetric flow rate*.

Metode yang digunakan dalam penelitian ini adalah metode input-output dengan memanfaatkan data primer dan data sekunder yang diperoleh pada PLTU Teluk Sirih selanjutnya diolah untuk mengetahui korelasi antara *high voltage DC* dan *volumetric flow rate fly ash* dengan efisiensi *electrostatic precipitator*, serta juga mendapatkan nilai *high voltage DC* dan *volumetric flow rate* yang tepat agar dapat menjadi acuan terbaru oleh operator dalam melakukan penyettingan.

Hasil dari penelitian ini diperoleh hubungan antara *high voltage DC* dengan efisiensi *electrostatic precipitator* berkorelasi positif, sedangkan hubungan antara *volumetric flow rate fly ash* dengan efisiensi *electrostatic precipitator* berkorelasi negatif. Didapatkan *high voltage DC* pada *field 1* sebesar 63 KV, pada *field 2* sebesar 53KV, pada *field 3* sebesar 48KV, dan pada *field 4* sebesar 49KV. Pada *Volumetric flow rate* diperoleh nilai optimal pada 122,99 m³/s. Berdasarkan pengoptimalan kedua parameter tersebut diperoleh peningkatan efisiensi *electrostatic precipitator* menjadi 99,88% dengan total *fly ash* yang mampu ditangkap perharinya sebanyak 56,32 Ton.

Kata kunci: *Electrostatic Precipitator, High Voltage DC, Volumetric flow rate, Fly ash*

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**ANALYSIS EFFICIENCY OF ELECTROSTATIC PRECIPITATOR
TYPE ONE STAGE BASED ON HIGH VOLTAGE DC AND VOLUMETRIC
FLOW RATE FLY ASH WITH CASE STUDY UNIT 1 PLTU
IMPLEMENTATION OF SIRIH BAY GENERATION,
PAINAN, SUMATRA BARAT**

by

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ABSTRACT

The non-optimal performance of electrostatic precipitators in capturing fly ash from coal combustion has resulted in an increase in the level of environmental pollution around the Sirih Bay power plant. There are several factors that affect the ability of electrostatic precipitators to catch fly ash including the size of fly ash, the value of high voltage DC, volumetric flow rate, the distance between the collecting plate electrode, and the area of the collecting plate electrode. This research is focused on DC high voltage and volumetric flow rate.

The method used in this research is a input-output method by utilizing primary and secondary data obtained at the Sirih Bay PLTU which is then processed to determine the correlation between high voltage DC and volumetric flow rate fly ash with electrostatic precipitator efficiency, and also get high DC voltage values and volumetric flow rate is right in order to be the latest reference by the operator in carrying out the filtering.

The results of this study obtained a relationship between high voltage DC with electrostatic precipitator efficiency is positively correlated, while the relationship between volumetric flow rate fly ash with electrostatic precipitator efficiency is negatively correlated. The DC high voltage in field 1 is 63 KV, in field 2 is 53KV, in field 3 is 48KV, and in field 4 is 49KV. At the Volumetric flow rate an optimal value of $122.99 \text{ m}^3/\text{s}$ is obtained. Based on the optimization of the two parameters, it was obtained an increase in the efficiency of the electrostatic precipitator to 99.88% with a total fly ash that was able to be caught daily as much as 56.32 tons.

Keywords: Electrostatic Precipitator, High Voltage DC, Volumetric flow rate, Fly ash
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