

**ANALISIS RADIUS PERLINDUNGAN PENANGKAL PETIR ELEKTROSTATIS
MENGUNAKAN METODE *ROLLING SPHERE* PADA BANGUNAN *COAL*
BOILER PT AJINOMOTO INDONESIA MOJOKERTO FACTORY**

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ABSTRAK

Negara Indonesia memiliki letak geografis pada garis khatulistiwa dan beriklim tropis. Musim kemarau dan musim hujan pada setiap musim akan terjadi dengan cukup ekstrim salah satunya musim hujan. Bersamaan dengan itu musim hujan akan terjadi sambaran petir. Intensitas sambaran petir yang cukup mengkhawatirkan di Indonesia juga bangunan – bangunan tinggi. Berdasarkan data sambaran petir BMKG Stasiun Geofisika kelas II Pasuruan pada Kabupaten Mojokerto tahun 2023 terdapat 382.516 sambaran. Pada bangunan *coal boiler* PT. Ajinomoto Indonesia Mojokerto *Factory* terdapat penangkal petir elektrostatik yaitu *E.F Lightning Protection System*. Bangunan *coal boiler* memiliki struktur yang cukup luas dan komponen didalamnya yang berupa *boiler*. Memiliki struktur bangunan yang banyak bersifat konduktor lebih rawan terhadap aliran listrik bertegangan tinggi. Perhitungan radius penangkal petir pada bangunan berdasarkan beberapa indeks menghasilkan tingkat proteksi III dengan radius 45 m. Struktur bangunan *coal boiler* yang berbentuk seperti huruf L maka metode yang digunakan untuk perhitungan yaitu metode *Rolling Sphere*. Penelitian ini dilakukan dengan mengobservasi penangkal petir *E.F Lightning Protection System* dan melakukan pengukuran resistansi pentanahan sesuai dengan standar PUIL 2000 yaitu kurang dari 5Ω . Didapatkan nilai tahanan pentanahan yang cukup tinggi 410Ω , pada penelitian kedua telah dilakukan *maintenance* dengan penambahan *grounding* didapatkan nilai tahanan pentanahan yang bagus $2,02\Omega$.

Kata Kunci : Sambaran Petir, Bangunan *Coal Boiler*, *E.F Lightning Protection System*, Metode *Rolling Sphere*

**ANALYSIS OF PROTECTION RADIUS OF ELECTROSTATIC LIGHTNING ROD
USING ROLLING SPHERE METHOD IN COAL BOILER BUILDING PT
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ABSTRACT

Indonesia is geographically located on the equator and has a tropical climate. The dry season and rainy season in each season will occur with quite extreme, one of which is the rainy season. At the same time, the rainy season will occur lightning strikes. The intensity of lightning strikes is quite alarming in Indonesia as well as tall buildings. Based on data on lightning strikes from the BMKG Geophysical Station class II Pasuruan in Mojokerto Regency in 2023 there were 382,516 strikes. In the coal boiler building of PT Ajinomoto Indonesia Mojokerto Factory there is an electrostatic lightning rod, namely the E.F Lightning Protection System. The coal boiler building has a fairly extensive structure and components in the form of boilers. Having a building structure that has many conductors is more prone to high-voltage electricity. Calculation of the lightning rod radius in buildings based on several indices results in protection level III with a radius of 45 m. The structure of the coal boiler building is shaped like the letter L, so the method used for calculation is the Rolling Sphere method. This research was conducted by observing the E.F Lightning Protection System lightning rod and measuring the grounding resistance in accordance with the PUIL 2000 standard, which is less than 5Ω . A fairly high grounding resistance value of 410Ω was obtained, in the second study maintenance was carried out with the addition of grounding, a good grounding resistance value of 2.02Ω was obtained.

Keywords: *Lightning Strike, Coal Boiler Building, E.F Lightning Protection System, Rolling Sphere Method*