## ABSTRAK

Penggunaan energi listrik di Indonesia saat ini sangatlah tinggi, namun energi yang digunakan masih didominasi oleh energi fosil yang sebaiknya harus digantikan oleh energi terbarukan seperti angin misalnya. Tujuan dari penelitian ini adalah untuk menganalisis kinerja Turbin Angin Sumbu Horizontal (TASH) bilah spiral tiga *blade* terkait efek *solidity number* dengan diameter 1536 mm dan panjang *cord* 500 mm. Metode yang digunakan pada penelitian ini yaitu uji lapangan di tepi pantai Tanjung Pasir, Kabupaten Tangerang, Banten. Kinerja TASH dinilai dengan parameter terukur seperti nilai tegangan, arus keluaran generator dan nilai torsi; juga non-dimensional parameter seperti koefisien daya, $C_P$, koefisien torsi ,Ct dan nilai *Tip Speed Ratio,TSR* yang dihasilkan karena putaran TASH pada setiap kecepatan angin dari 1 m/s sd 6 m/s. Hasil uji lapangan didapatkan Daya aktual eksperimen = 9.991 Watt dan nilai torsi = 6.0 N.m pada kecepatan angin 5 m/s, Cp = 0.066 dan Ct = 0.674 pada kecepatan angin 2.0 m/s, Solidity number = 0.976 mm.



**Kata Kunci:** TASH Bilah Spiral, *Solidity Number,* koefisien daya $C_p$, koefisien torsi $C_t$ , *Tip Speed Ratio.*

*FIELD TEST STUDY ON WIND TURBINE PERFORMANCE HORIZONTAL AXIS THREE SPIRAL BARS RELATED TO SOLIDITY NUMBER EFFECTS*


## *ABSTRACT*

*The use of electrical energy in Indonesia is currently very high, but the energy used is still dominated by fossil energy which should be replaced by renewable energy such as wind for example. The purpose of this study was to analyze the performance of a three-blade spiral horizontal axis wind turbine (TASH) related to the solidity number effect with a diameter of 1536 mm and a cord length of 500 mm. The method used in this study was a field test at Tanjung Pasir beach, Tangerang Regency, Banten. TASH performance is assessed by measured parameters such as rated voltage, generator output current and torque value; also non-dimensional parameters such as power coefficient, Cp, torque coefficient, Ct and Tip Speed Ratio, TSR values generated due to TASH rotation at every wind speed from 1 m/s to 6 m/s. Field test results obtained actual experimental power = 9.991 Watt and torque value = 6.0 Nm. at a wind speed of 5 m/s, Cp = 0.066 and Ct = 0.674 at a wind speed of 2.0 m/s, Solidity number = 0.976 mm.*



***Keywords:*** *TASH Spiral Bar, Solidity Number, power coefficient, Cp, torque coefficient, Ct, and Tip Speed Ratio, TSR value.*