ABSTRAK

Penelitian dan pengkajian terhadap Turbin Angin Sumbu *Horizontal* (TASH) model bilah spiral tipe *drag* dengan variasi jumlah bilah enam *blade* sampai saat ini masih jarang ditemukan dibandingkan dengan TASH model konvensional tipe *lift* seperti TASH Gorlov atau airfoil bilah NACA. Penelitian dilakukan menggunakan jenis Turbin Angin Sumbu *Horizontal* (TASH) enam *blade* terkait efek *solidity number* dengan tujuan untuk mengetahui unjuk kerja TASH dengan diameter 1,536 m. Metode yang digunakan yaitu uji lapangan di tepi pantai Tanjung Pasir, Tangerang, Banten. Kinerja TASH dinilai dengan parameter terukur seperti nilai tegangan, arus keluaran generator, dan nilai torsi; serta parameter non dimensi seperti koefisien daya (*Cp*), koefisien torsi (*Ct*) dan *Tip Speed Ratio (TSR)* yang dihasilkan akibat putaran TASH pada setiap kecepatan angin dari kecepatan angin 3,2 m/s hingga 4,7 m/s. Hasil uji lapangan diperoleh Daya aktual eksperimen = 1,72 Watt dan nilai torsi = 11,9 N.m pada kecepatan angin 4,7 m/s. *Cp* = 0.033, *Ct* = 1.09, dan *TSR* = 2,05 pada kecepatan angin 3,2 m/s, *Solidity number* = 1,953.

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

FIELD TEST STUDY ON THE PERFORMANCE OF THE HORIZONTAL AXIS WIND TURBINE OF SIX SPIRAL BLADES RELATED TO SOLIDITY NUMBER EFFECT

ABSTRACT

Research and studies on the Horizontal Axis Wind Turbine (TASH) model of drag-type spiral blades with variations in the number of blades of six blades are still rare compared to conventional TASH lift-type models such as TASH Gorlov or NACA blade airfoils. The study was conducted using a six-blade Horizontal Axis Wind Turbine (TASH) related to the solidity number effect with the aim of knowing the performance of TASH with a diameter of 1.536 m. The method used is a field test on the shores of Tanjung Pasir, Tangerang, Banten. TASH performance is assessed by measured parameters such as rated voltage, generator output current, and torque value; as well as non-dimensional parameters such as power coefficient (Cp), torque coefficient (Ct) and Tip Speed Ratio (TSR) resulting from TASH rotation at every wind speed from 3.2 m/s to 4.7 m/s. Field test results obtained experimental actual power = 1,72 Watt and torque value = 11,9 N.m at a wind speed of 4.7 m/s. Cp = 0.033, Ct = 1.09, and TSR = 2,05 at a wind speed of 3.2 m/s, Solidity number = 1.953

Keywords: *spiral blade TASH, solidity number, power coefficient Cp, torque coefficient Ct, tips speed ratio*