A development of testing platforms for composite blades of stackable vertical axis wind turbine

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ABSTRACT

We give careful consideration to energy development in Taiwan under the issues of energy shortage and environmental protection in today's world. Wind power has already become a great commercial value; it is cheap, clean and easy to be attained. However, the efficient executions of wind power and environmental protection policies have become the world's common goal. Wind turbines can be classified into two main categories, namely, horizontal axis and vertical axis wind turbines [HAWT and VAWT]. Especially for VAWT, it had no adequate engineering case to exploit and had no international standard to refer. Therefore, in according with the relevant IEC-61400 standards, it is development of clamping apparatus to test the composite blades in test platforms, and use engineering software (CAD/CAE) to support the design and experimental stage. In addition, it is effective to short the design cycle and reliability of simulated analysis. Finally, we are discussed the failure modes and test results of the SVAWT blades under different manufacturing processes to verify the proposed experimental setup methods and manufacture techniques of the SVAWT blades pass static test and fatigue test systems are performed, and established the fatigue life equation by fatigue theory can effectively prediction the life of SVAWT blades. The information of technology developed can be provided.

Keywords : Clamped apparatus、Vertical-axis wind turbines、Finite element analysis、Fatigue、Stackable

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