WE_11
陸域風場噪音量測與傳遞模擬
On-shore Wind Farm Noise Measurement and Propagation Prediction

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摘要

本文主要展現依據 IEC 61400-11 風力發電機噪音量測技術規範與環保署制訂之環境噪音測量方法 (NIEA P201.95C)及使用 ISO 9613 戶外噪音傳遞衰減模式對風力發電機之噪音傳遞特性進行調查與特性，藉由不同距離位置、不同風速與風機操作條件下量測之噪音對風力發電機噪音與操作條件進行解析。調查結果中發現，在風機運轉條件達到最大發電量時，風機發電量與轉子速度約成定值，發電量不隨風速增加而提升；而在額定發電功率 20 %至 80 %間，風機噪音位準值變化與發電量成線性關係：在調查數據中發現環境噪音量（風噪音）與風速呈一次線性正比關係。隨著風速與距離增加之噪音傳播條件下，風力發電機之噪音(事件音)會被強風所造成之風雜音(背景噪音)所覆蓋，造成量測實驗與模擬結果差異隨風速與傳遞距離增加而增加。

關鍵詞：風力發電機、噪音預測、噪音傳遞。

Abstract

This paper shows the noise survey and predict of the wind turbine generator in compliance with the IEC 61400-11, the NIEA P201.95C and ISO 9613 standards, which are wind turbines acoustic noise measurement techniques , environmental noise measurement procedure set required by Environmental Protection Agency, and the calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources, respectively. The noise propagation characteristics for different measuring distances from wind turbine under various wind speed conditions are illustrated. The wind turbine generator noise levels are shown with a strongly linear correlation to the wind speeds at the rated power of 20% to 80%, while the noise levels are almost maintained constant despite the wind speed is continuously rising until the wind turbine has reached its maximum rated power. Moreover, the higher the wind speed and the longer the propagation distances made the larger differences between the noise experimental survey and numerical prediction results. This means that over a certain distance and wind speed condition the wind turbine noise (event noise) will merge in the wind noise (background noise).

Keywords: Wind turbine, Noise prediction, Noise propagation.