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海氣象資料於離岸風場開發之整合應用

Integrated Application of Met-Ocean Data for Offshore Wind Farm Development

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摘要

臺灣離岸風電產業正開始蓬勃發展。為評估離岸風場於選址、可行性研究、規劃設計、施工安裝、營運維護乃至除役等生命週期各階段所需之相關環境參數，以獲得兼顧安全且經濟之開發方案，海氣象資料之整合扮演相當重要的角色。惟過去臺灣海峽海氣象觀測資料十分缺乏，可供利用之資料多半是陸上氣象站與近岸氣象浮標資料，較少有離岸的長期實測資料。

本研究為協助海洋風力發電公司執行海洋 I 離岸風場第二階段開發計畫(Formosa I Offshore Wind Farm phase 2)之基礎設計工作，特蒐集風場鄰近區域之新竹氣象站、竹南氣象站及新竹資料浮標等測站之長期海氣象資料，透過統計與數值分析建立該風場之代表性海氣象環境參數以供基礎設計使用。此外，為掌握即時的海氣象資料，本研究亦開發一套海氣象資料管理系統，除可即時擷取中央氣象局開放資料平臺之最新海氣象資料外，亦透過統計分析更新相關環境參數以作為風場開發各階段環境條件之參考基準。

關鍵詞：海氣象資料、海氣象資料管理系統、環境條件、離岸風力發電。

Abstract

The offshore wind energy industry is growing up in Taiwan. The integration of met-ocean data is very important to obtain the environmental conditions in the whole life cycle of offshore wind farm, i.e. the phases of site screening, feasibility study, planning, design, construction, operation, maintenance and decommission, to draw up the safer and more economical development program. Unfortunately, there has been quite a few long-term met-ocean data for those offshore sites in Taiwan Strait. Most of the met-ocean data available were measured from the onshore weather stations and the nearshore buoys.

In order to support the Formosa I Wind Power Company to develop the Formosa I offshore wind farm phase 2, this study collected the long-term met-ocean data from Hsinchu Weather Station, Zhunan Weather Station and Hsinchu Buoy to estimate the representative environmental parameters for foundation design by the statistics and numerical analyses. Furthermore, we developed a met-ocean data management system which could automatically capture the nearly real-time met-ocean data from the CWB's open data web platform to update the environmental parameters by ongoing statistics. The results could be regarded as the basis of reference for all the stages of the Formosa I wind farm development.

Keywords: Met-ocean data, Met-ocean data management system, Environmental conditions, Offshore wind energy.