

離岸風電施工維護船機技術開發計畫

執行單位

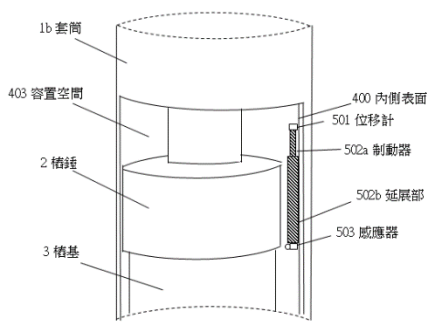
船舶中心

計畫主持人

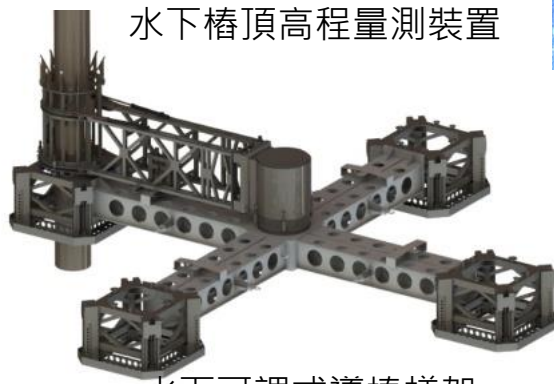
李旭成

- 水下可調式導樁樣架技術開發預計應用於離岸風機套管式基礎安裝預打樁流程，以確保基樁的安裝位置與垂直度。
- 千噸級水下基座施工船機技術預計應用於離岸風機運輸安裝作業。

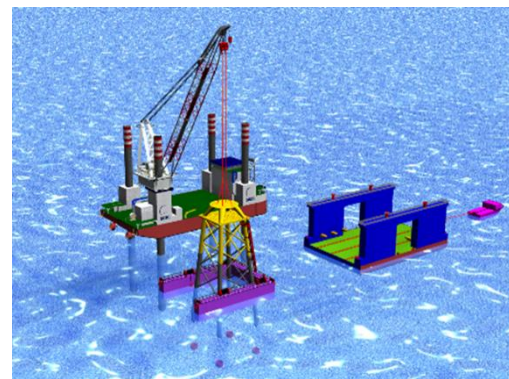
1. 旋臂式樣架及其運作方法
台灣申請號 106119520
、英國申請號 1716997.0
2. 樁頂高程量測裝置及方法
台灣申請號 106145381
、英國申請號 1722048.4
3. 千噸級水下基座施工船機
技術針對安裝方法、設備
與載具進行專利家族申請
，且在台灣與中國大陸進
行專利佈局，總共5件，
台灣專利已獲准(證書號
I585295、I593879、
M521669)。



水下樁頂高程量測裝置



水下可調式導樁樣架



離岸風機運輸安裝流程

1. 水下可調式導樁樣架技術

離岸風力發電建置套管式基礎所需要的水下導樁技術，國際上僅有少數廠商擁有相關機具以及施作的實績，為因應我國發展離岸風電產業需求，本計畫提出發展水下打樁樣架技術，該導樁樣架具備補償海床1公尺高低差能力，可引導基樁安裝於預定深度。各基樁之樁頂高度位置在安裝後必須保持一致，以確保後續套管式基礎之安裝，因此本打樁樣架具備樁頂高程量測系統，可即時量測樁頂高度，用以滿足各樁頂之間誤差小於1公分以內。

2. 千噸級水下基座施工船機技術

國內尚缺乏有效機具可供吊裝，使用現有船機設備經由施工船機技術之加持，作為因應策略，以支援離岸風機安裝作業需求。

可將基座施工安裝能量提升至千噸級，替代完成千噸級水下基座之安裝作業，滿足過渡期內產業需求。

Offshore wind farm installation and maintenance technology development

Execution Unit

Ship and Ocean Industries R&D Center

Project Director

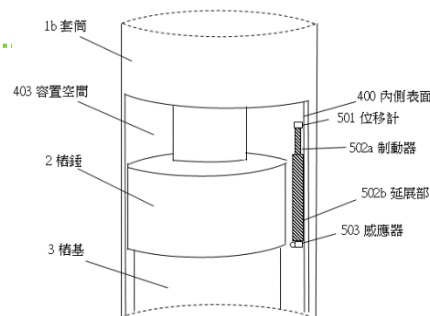
Hsu-Cheng Lee

- The underwater pre-piling template technology will be applied to offshore wind turbine jacket foundation installation pre-piling progress to ensure the correct position and verticality of the each pile.
- Offshore wind farm 1000-ton jacket foundation construction technology will be applied to offshore wind turbine jacket foundation transportation and installation process.

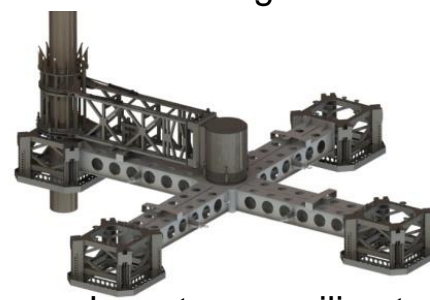
1. Rotatable arm coupled pile guide frame and the operating method thereof. Taiwan application no.106119520、UK application no.1716997.0

2. Apparatus and methods for pile head leveling thereof. Taiwan application no.106145381、UK application no.1722048.4

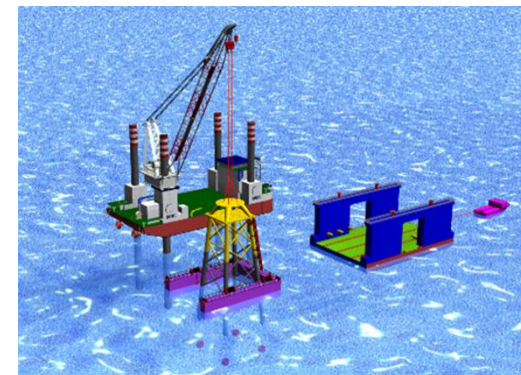
3. The technology has been applied in the patent family for the installation method, equipment and vessel, and the patent layout has been carried out in Taiwan and mainland China for a total of five patents granted in Taiwan (certificates I585295, I593879, M521669)



The underwater pile stick up measuring device



The underwater pre-piling template



jacket foundation installation process of offshore wind turbine

1. Underwater pre-piling template technology

Only few companies have equipment and working experience in installation of jacket foundation in the world. In order to address the industry requirements of offshore wind power in Taiwan, this project develops the underwater pre-piling template technology that have leveling capability to accommodate the sea bed and the mechanical adjustment is set to within 1 meter. The piles will be driven to the design depth and all piles shall keep the same level height of pile head. This is the key factor for keeping the jacket installed later with an acceptable leveling accuracy. Piling template hence equipped with a device to monitor the piling head position in the driving process. The measuring accuracy of height is set to within 10mm.

2. Offshore wind farm 1000-ton jacket foundation construction technology

The lack of effective lifting equipment for Taiwan offshore wind farm installation, to use the existing available vessel and equipment via blessing of construction machine technology as a response strategy to support offshore wind turbine installation requirements.

The transportation and installation of foreseen thousands tons wind turbine foundation can be achieved by using less lift capacity equipment as the developed technology.