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**Numerical and experimental studies on movable offshore wind turbine foundation**

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Due to the consideration of a great fleet of large ships needed for constructing offshore wind turbines not already been established in Taiwan, one concept is currently developing a novel “float-out, sink and retrieve” offshore installation method for offshore wind turbines. The concept is to construct the gravity base support structure for the wind turbine, assemble the wind turbine and complete functionality testing at the dock, prior to towing the installation to location. The proof-of-concept for this innovative movable type foundation was confirmed by conducting a series of interdisciplinary studies, including numerical simulation and laboratory tests. Safety condition for the towing process of the movable foundation in the sea site was investigated in the towing tank (150m x 8m x 4m) at the NCKU in advance. Then the stability during the installation of the foundation and the dynamic response of the foundation after it is settled firmly were studied and investigated by means of numerical simulation and small scale physical modeling tests. From further movable bed laboratory experiment, the maximum scour depth around the foundation under wave and current action was also obtained. Thus this study furtherly showed the concept has an added advantage that it will allow for retrieval or re-positioning of the foundation without the use of heavy vessel or other specialist offshore installation vessels.

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