

離岸風電產業溝通平台第9次會議

離岸風場水下技術整合 環境監測及海上設施檢修

SI of Underwater Environmental Monitoring
and IRM for BOP in Offshore Wind Farm

知洋科技有限公司 總經理 湛翔智 博士

Hsiang-Chih Chan, Ph.D./President, Awareocean Technology Co., Ltd.

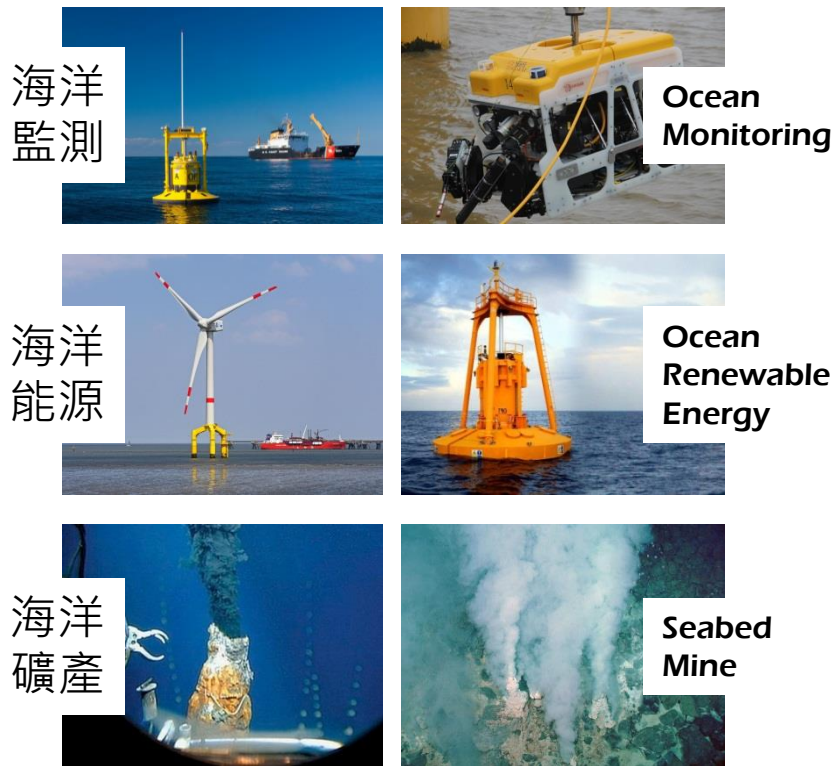
June 13, 2017



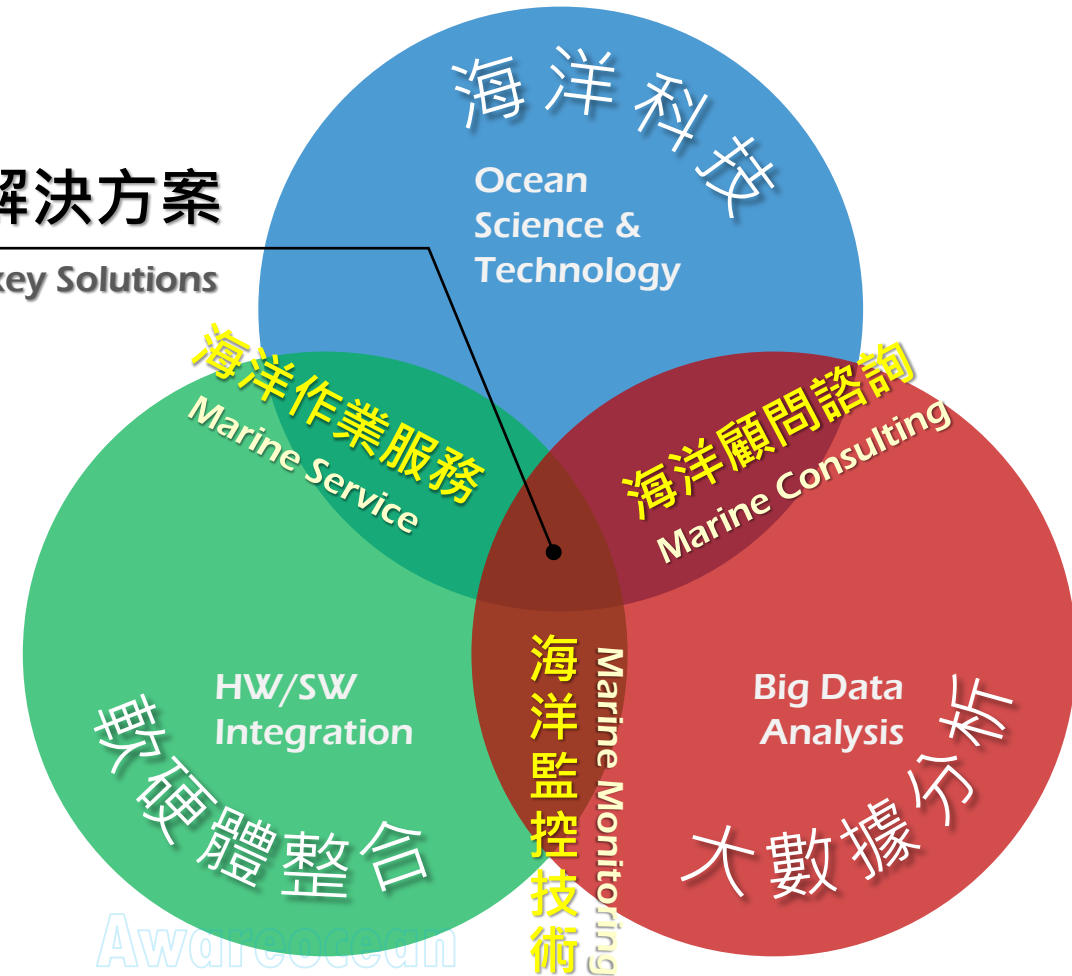


提供海洋工業物聯網所需的完整解決方案

We provide Turnkey Solutions of IoT for Marine Industry



完整解決方案 Turnkey Solutions





合作夥伴



原料供應

金屬、塑膠、橡膠、溶劑、油品、纖維、玻璃、新合成物



加工製造

材料混合、零件膠合、CNC加工、模具製造、射出成形



海洋作業

海上工作船舶、潛水作業、海床地形測繪、海上作業服務



硬體元件

電子零件、電路設計與製造、電源供應器、電線電纜、光電轉換器、光電連接器



軟體開發

機械控制、操作介面、監控介面、資料庫、數據分析、資料報表



檢測校正

聲光機電檢測儀器、校正設備、水壓測試、物理海洋儀器、電子雜訊檢驗、非破壞性檢測



政府部門

海洋經濟發展策略、海洋法規研究、海洋環境保護、海洋科普教育、海洋專業教育、海洋創業



學研單位

海洋科技產學合作、學術研討會議、前瞻技術研發、水槽測試操作、海上試驗操作



公協會

產業交流、貿易交流、技術交流、人才培訓、展覽籌辦、產業標準研究

Partners



Materials

Metals, plastics, rubber, solvent, oil, fiber, glass, new composition, etc.



Manufacturing

Material mixing, parts gluing, CNC machining, mold making, injection molding, etc.



Marine Services

Ocean engineering vessels, diving works, seabed topography mapping, maritime operations services, etc.



Hardware

Electronic components, circuit design and manufacturing, power supply, wire and cable, optical to electrical converters, optical/electrical connectors, etc.



Software

Mechanical control, operation interface, monitoring interface, database, data analysis, data reporting, etc.



Testing and Calibration

Acoustic/optic/electromechanical testing equipment, calibration equipment, water pressure testing, physical oceanographic equipment, electronic noise inspection, non-destructive testing, etc.



Government

Marine economic development strategy, law research, environmental protection, science education, and entrepreneurship counselling, etc.



University and Institution

Marine science and technology cooperation, academic seminar, forward technology research and development, testing in water tank operation, sea trials, etc.



Public Association

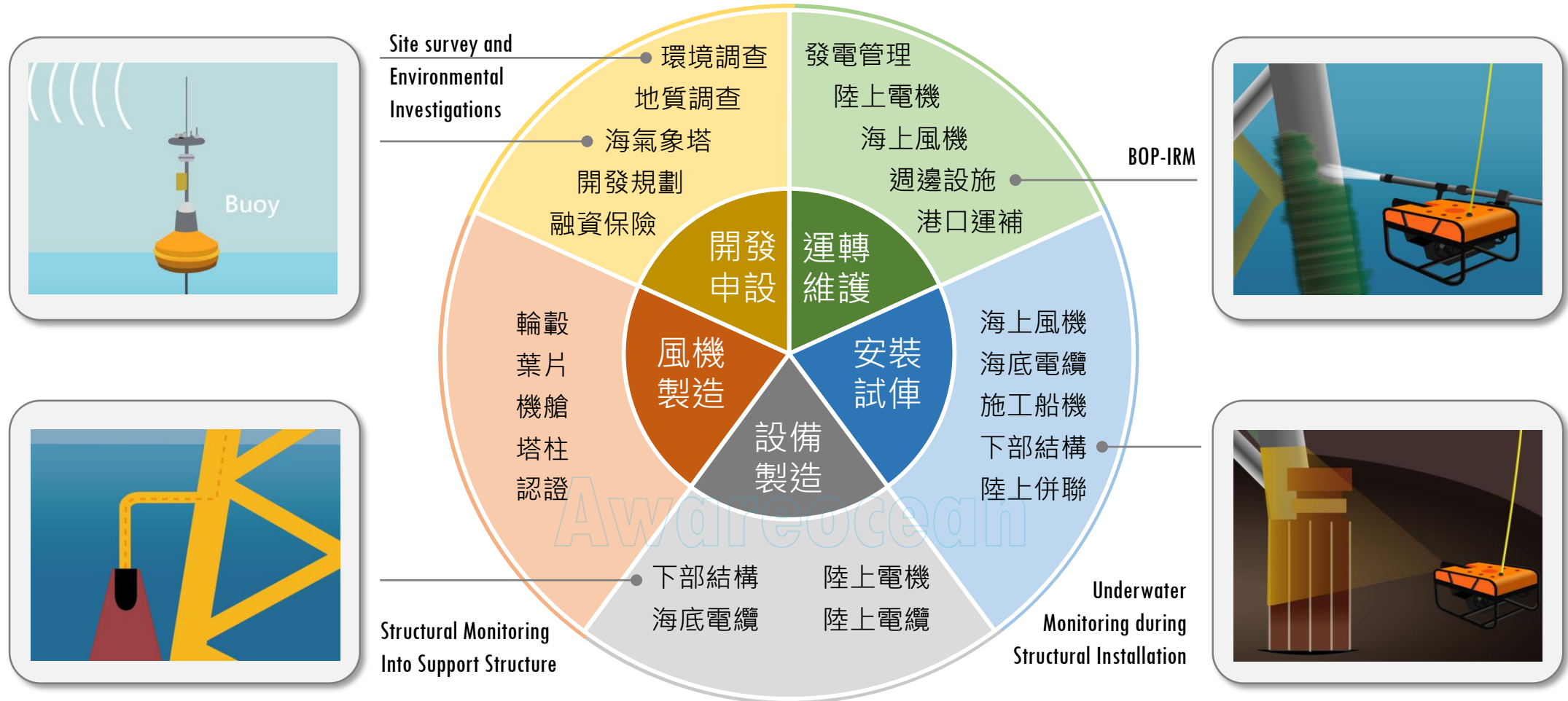
Industry exchange, trade exchange, technical exchange, personnel training, exhibition planning, industry standard research, etc.

離岸風電各階段供應鏈

Local supply chains are demanded



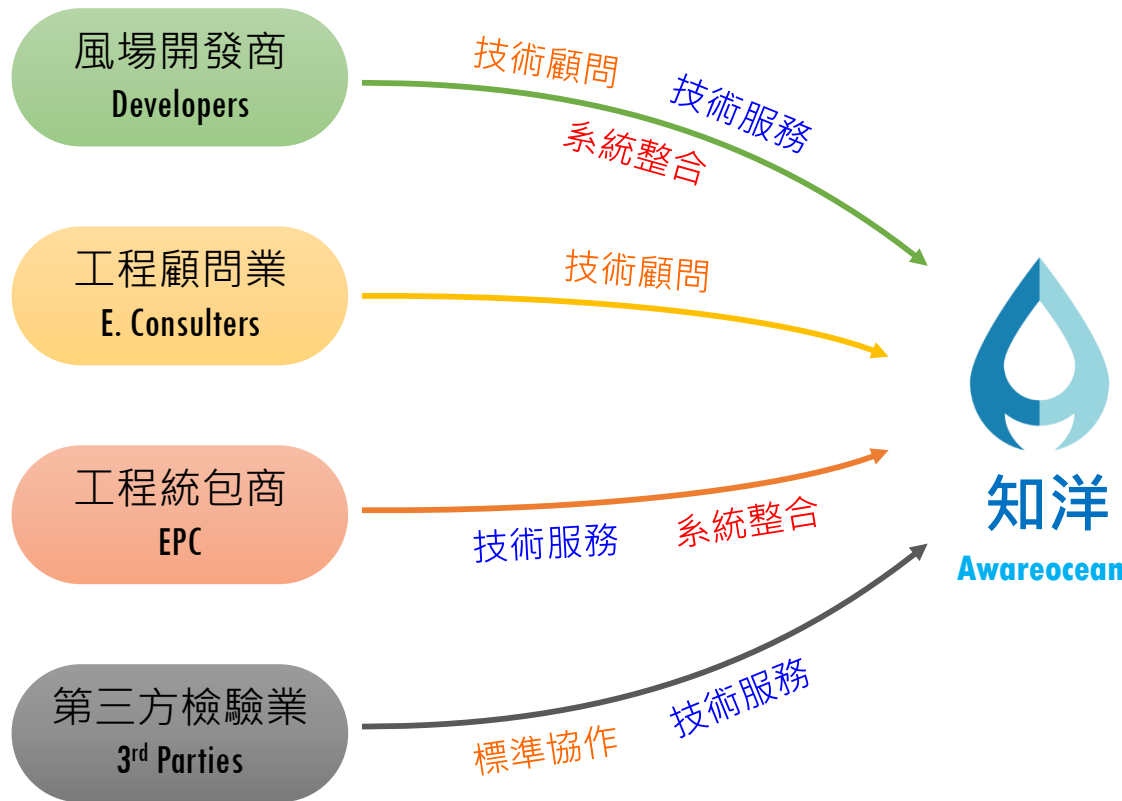
Supply Chains in Sectors by Development Phases for Offshore Wind Energy





離岸風電水下技術服務商業模式

Our Business Plan of Underwater Technology in Offshore Wind Farm



完整解決方案

Turnkey Solutions for

Underwater Technology Service & Consulting

Ocean Equipment and System Integration

A word cloud of services provided by Awareocean, centered around the company logo. The services include:

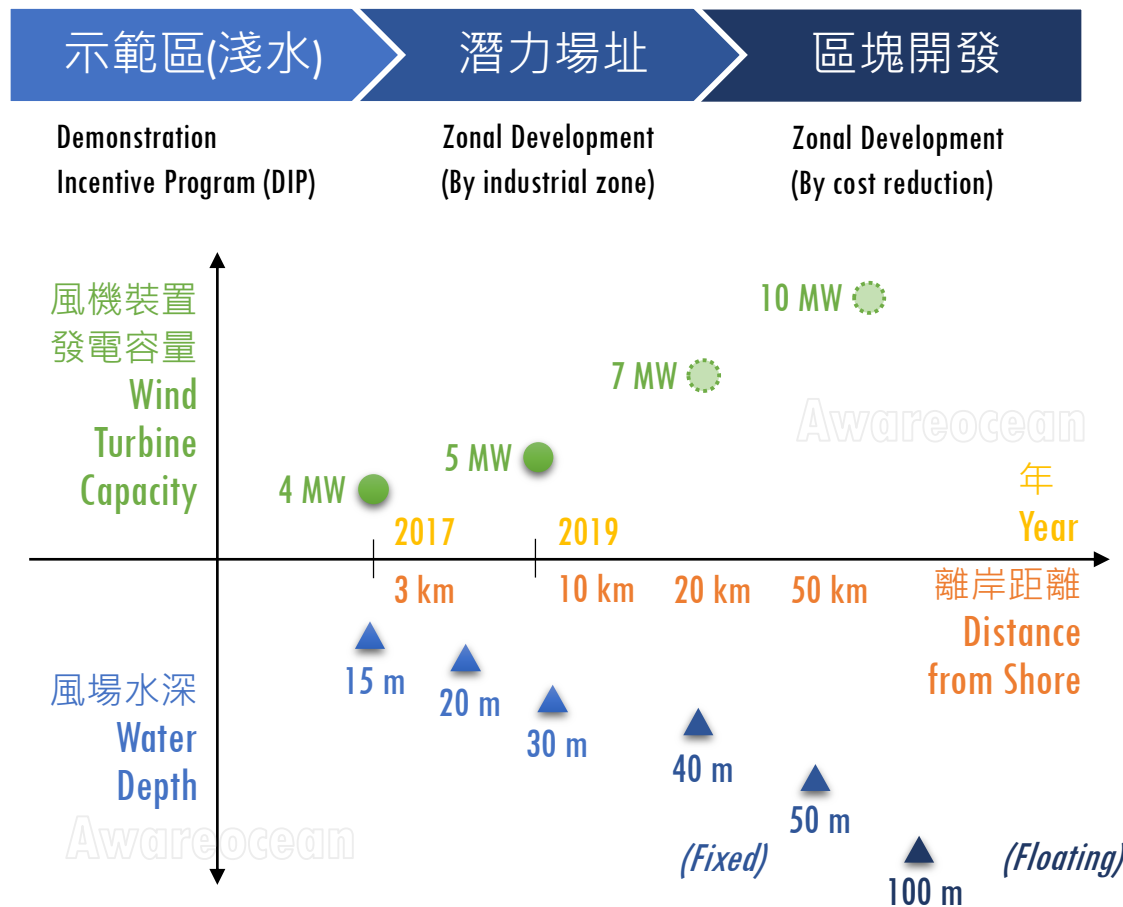
- 海上週邊設施檢查維修(IRM)服務
- 國際標準應用
- 水下作業規劃
- 結構安全監測系統
- 海洋環境監測系統
- 海上調查規劃
- 環境污染防治
- 文件流程協議
- 海洋數據品管
- 光機電設備整合
- 設備整合規劃
- 作業標準協作
- 水下噪音問題
- 離岸風場開發海上調查
- 水下噪音監測系統
- 施工安全衛生品質(QHSE)管理

臺灣離岸風場發展途徑及關鍵問題

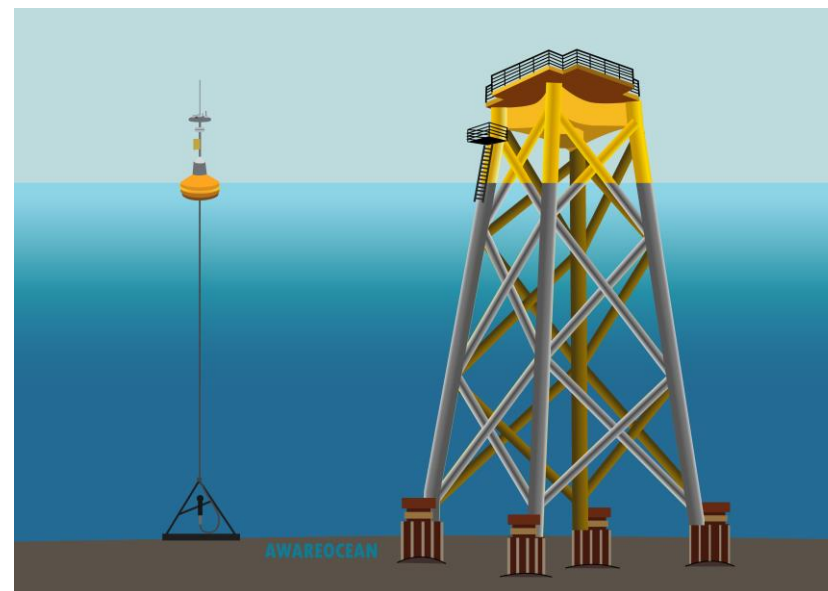


Development Roadmap and Issues of Offshore Wind Farm in Taiwan

離岸風電政策推動策略(Policy of Offshore Wind Energy Development)



- 環境影響問題(Environmental Impact)
- 施工船機需求(More Marine Vessels)
- 支撐結構加大(Larger Support Structure)
- 運維範圍增加(Increasing O&M Ranges)

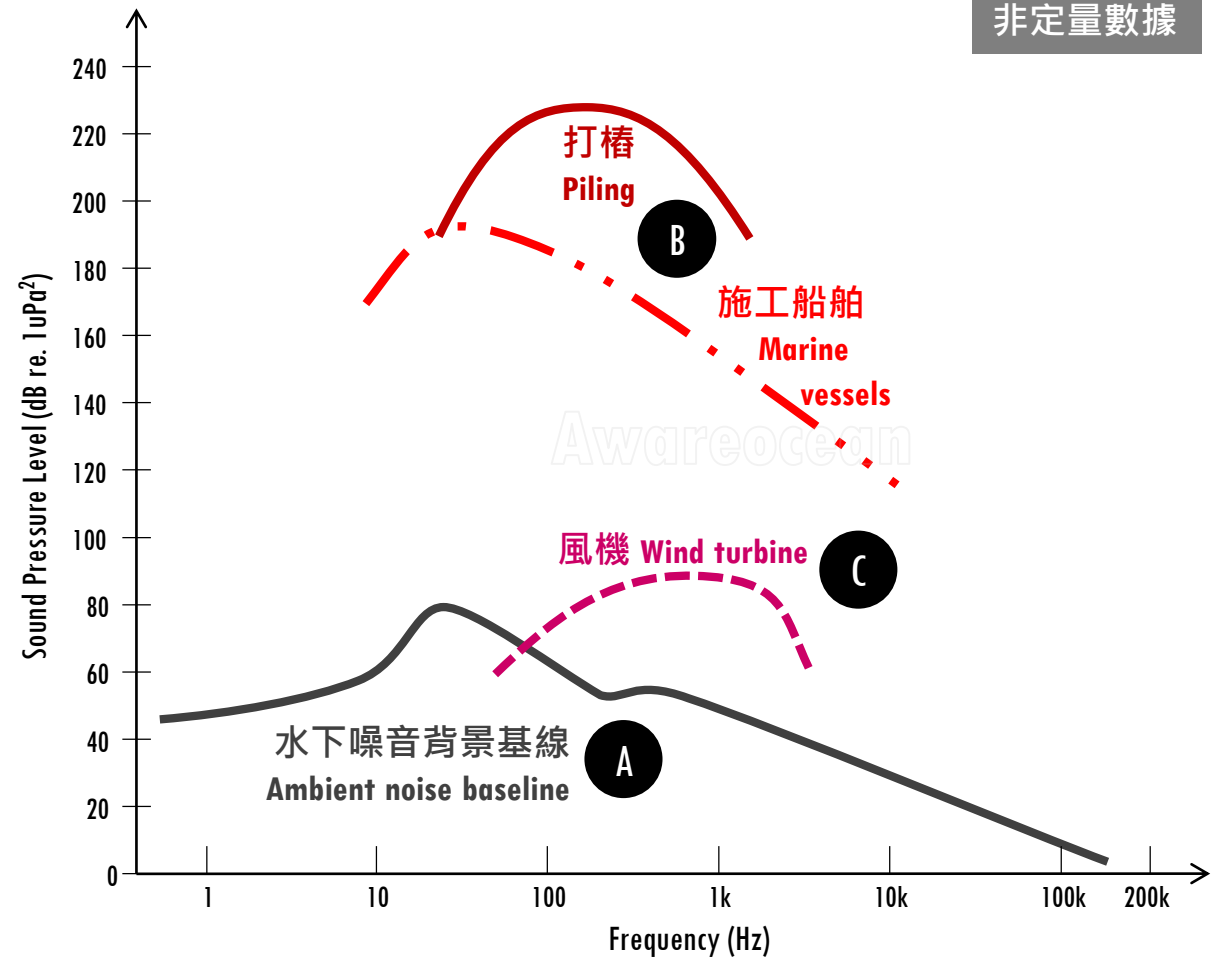
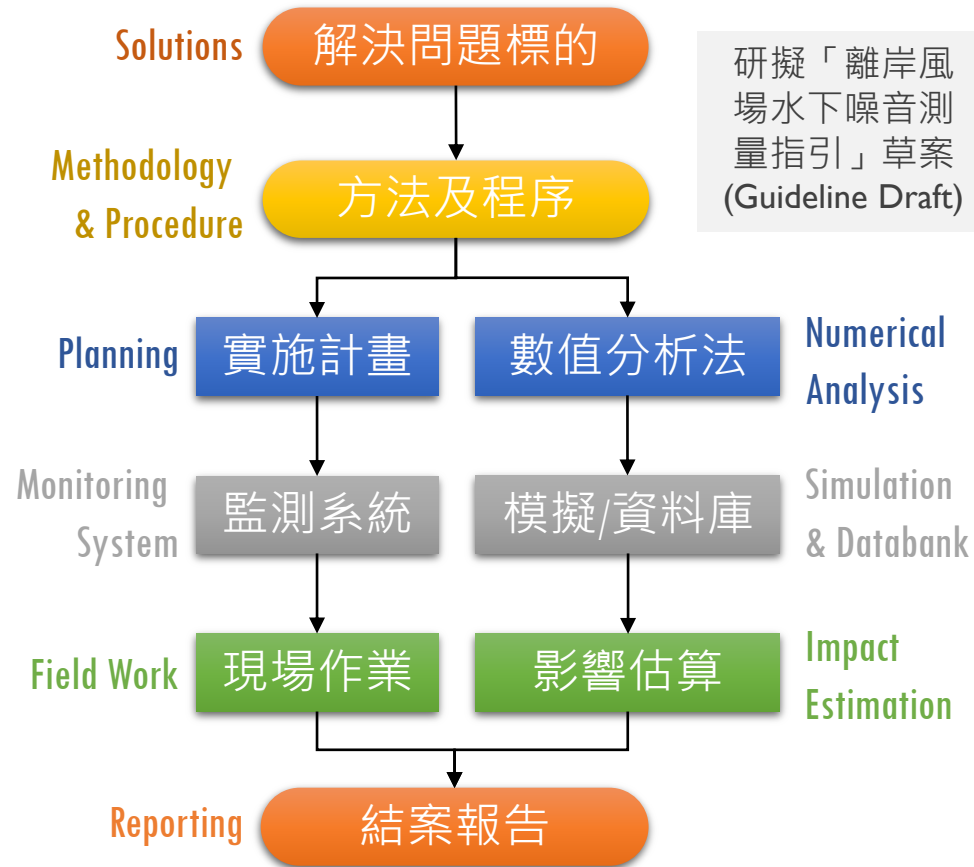


離岸風場開發水下噪音監測方案

★ 將於7月11日舉辦「MITA產業技術交流會議」
離岸風場水下噪音測量系統規格與監測作業研討



Solutions of Underwater Noise Monitoring in Offshore Wind Farm



非定量數據



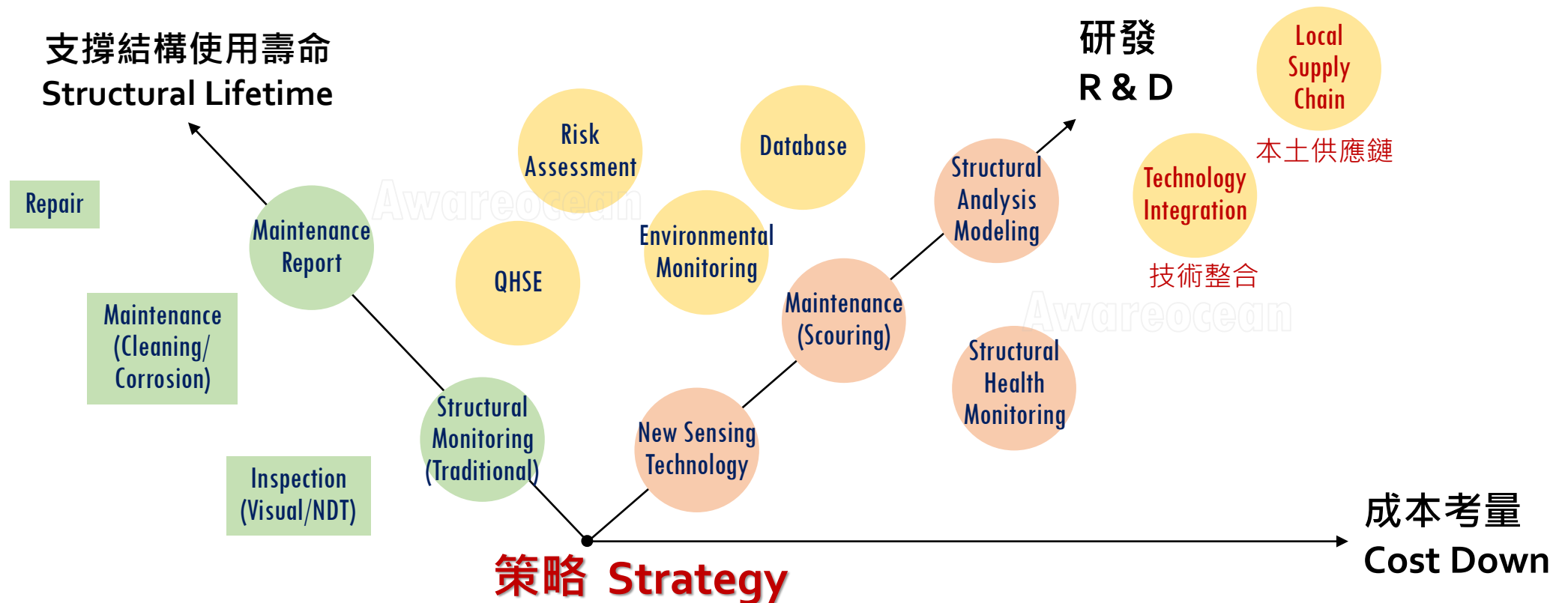
離岸風機支撐結構運維技術發展策略

Strategy for Support Structural O&M Technology in Offshore Wind Farm

產業技術商業發展
Industrial Technology

產業技術創新發展
Industrial Innovation

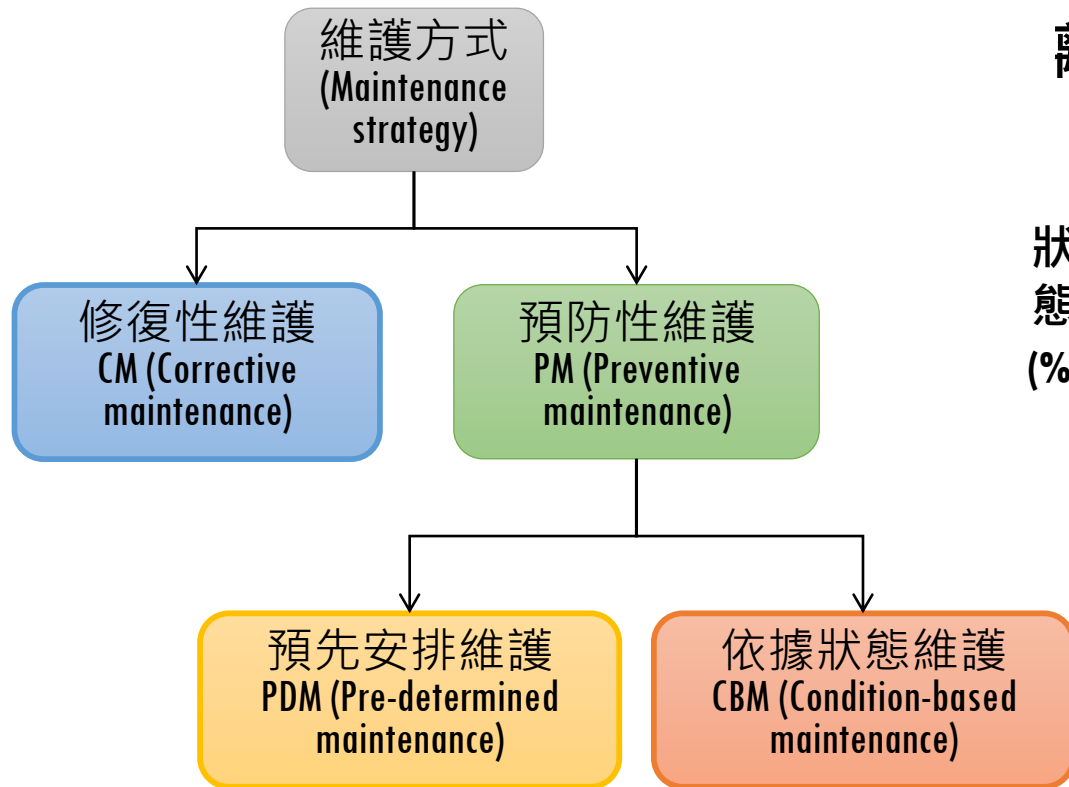
產學合作技術發展
Industry-university Cooperative Technology



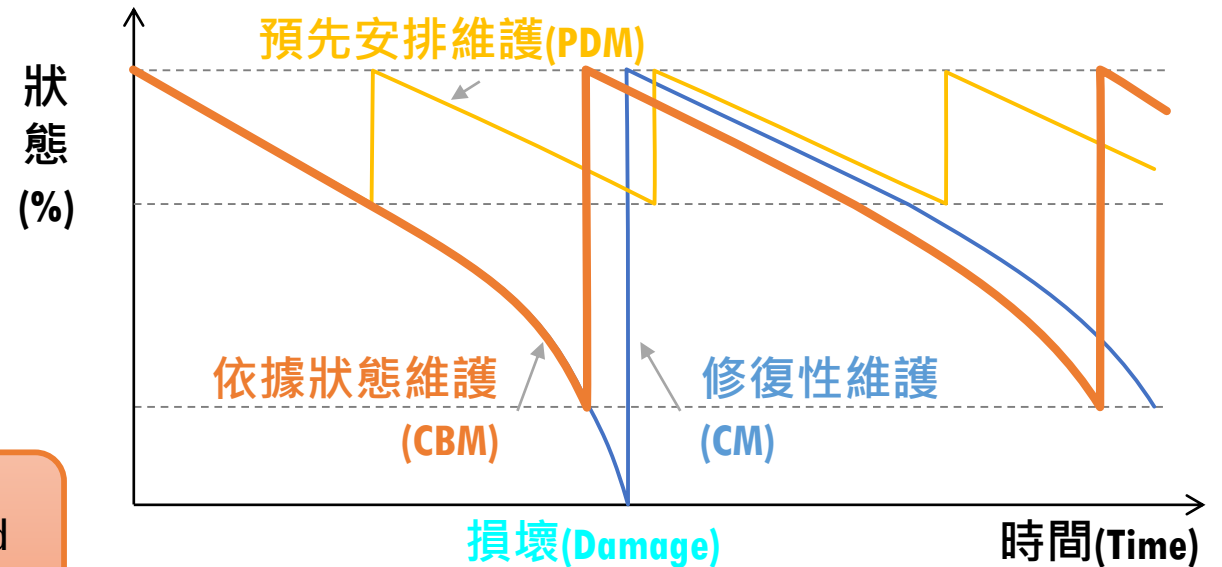


離岸風場海上設施維護策略

Strategy of BOP Maintenance in Offshore Wind Farm



離岸風場動員成本高建議採用**CBM**方式





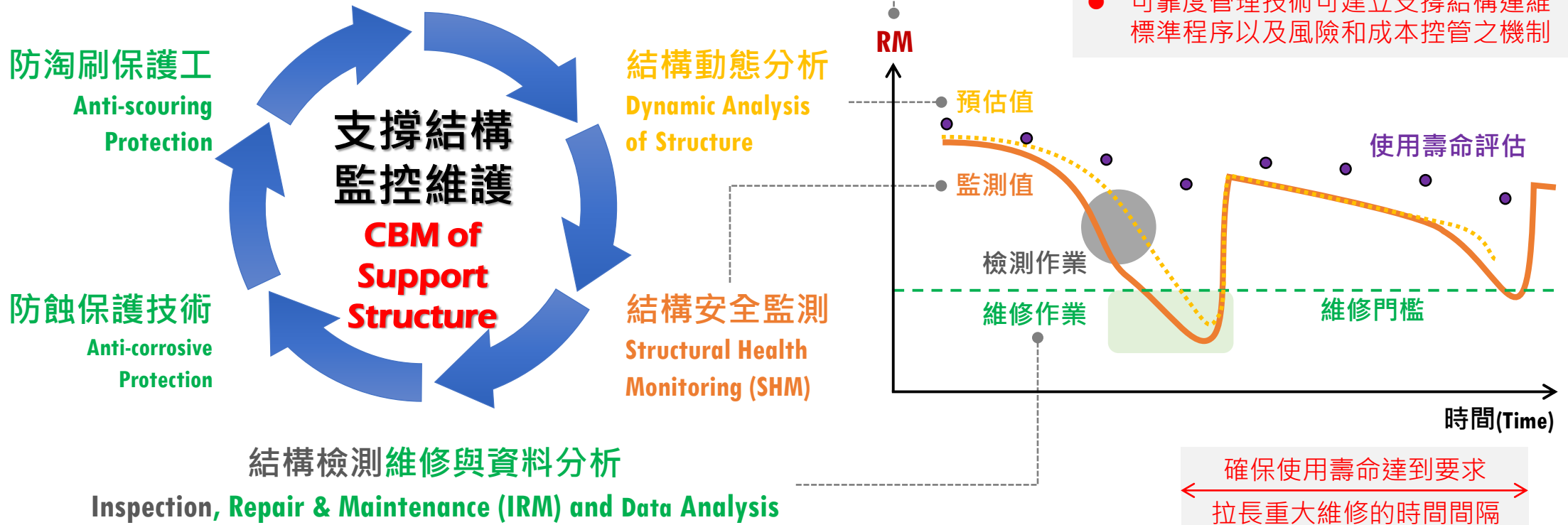
離岸風機支撐結構監測維護技術整合

Technological Integration of Monitoring and Maintenance of Support Structure in Offshore Wind Farm

可靠度管理及使用壽命評估

Reliability Management (RM) and Lifetime Assessment

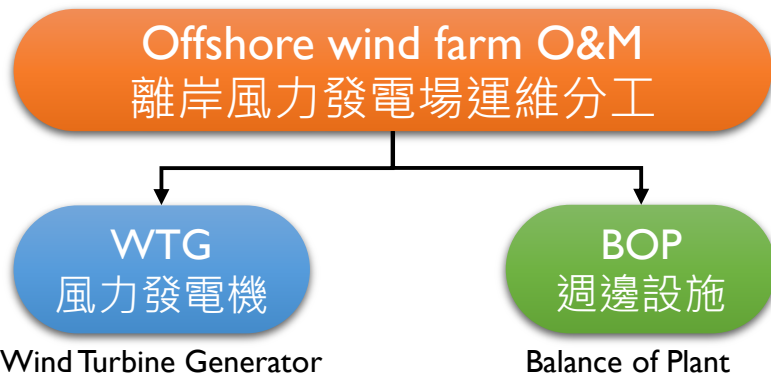
- 離岸風力機支撐結構需耐用20年以上受到環境與外力的損壞因素多且複雜
- 可靠度管理技術可建立支撐結構運維標準程序以及風險和成本控管之機制



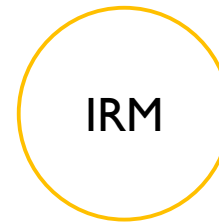


創新技術整合服務經營方式

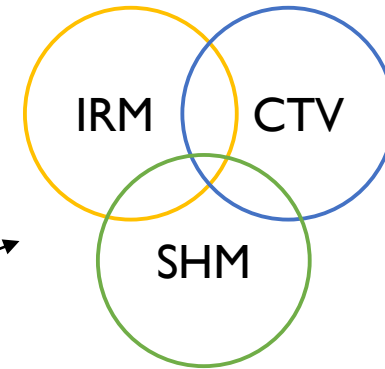
Innovated and Integrated Marine Service of BOP-IRM/CTV/SHM



國外經營方式
(統包服務)



知洋科技經營方式
(技術供應鏈整合)
Awareocean Integrated



離岸風場海陸設施除WTG以外稱為BOP | BOP-IRM重點：風機下部結構及海纜



新型態整合服務對客戶的重大效益

海上作業成本降低：資訊統整+動員反應快

運維風險控管提高：界面減少+程序標準化

檢查修理維護/IRM inspection, repair, maintenance
 人員運輸船舶/CTV crew transport vessel
 結構安全監測/SHM structural health monitoring

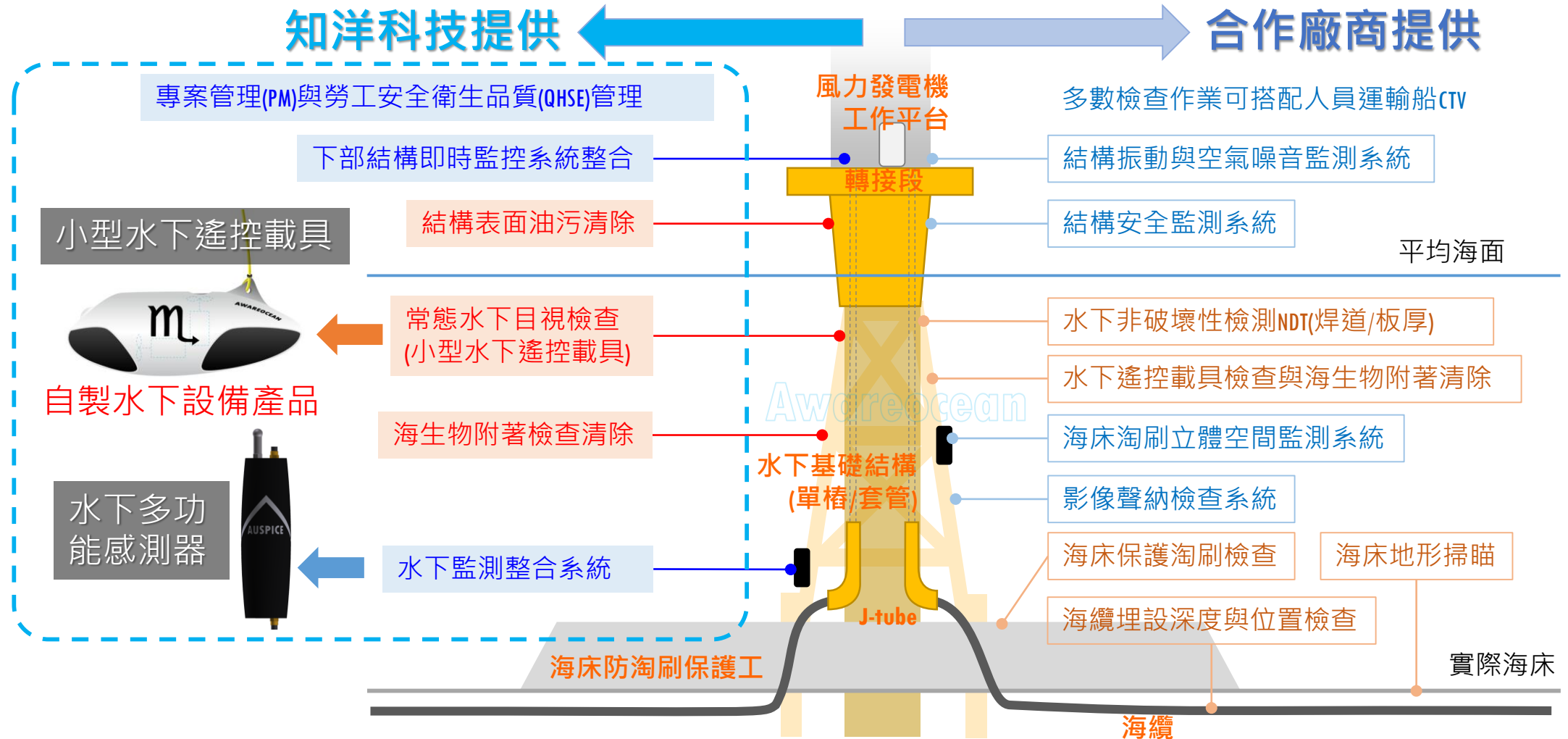


離岸風電BOP-IRM & SHM技術供應整合

Underwater IRM for BOP in Offshore Wind Farm

知洋科技提供

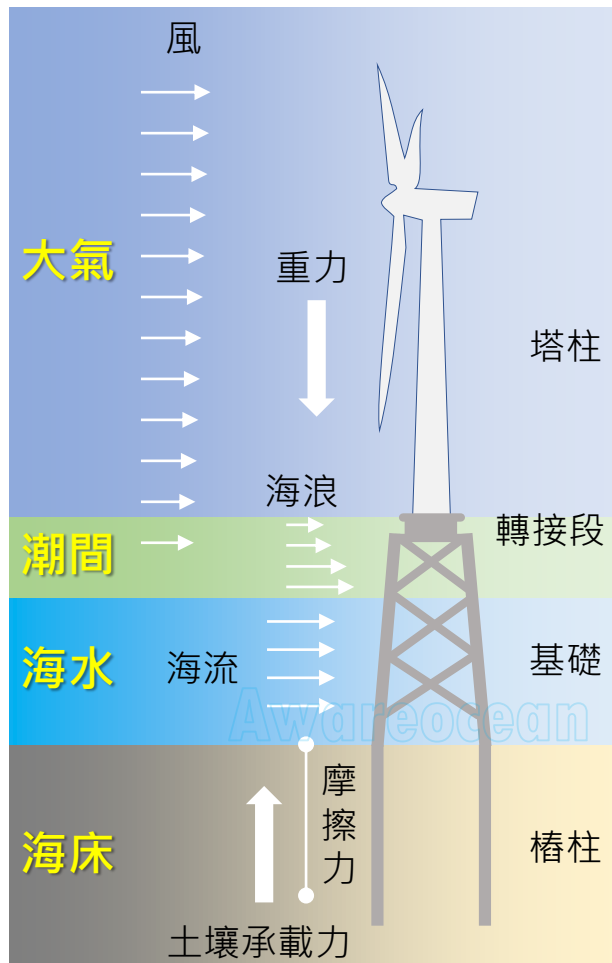
合作廠商提供





離岸風機支撐結構運維的關鍵問題及因應策略

Issues and Strategy for Support Structural O&M in Offshore Wind Farm



作業
難度

損壞
問題

易

腐蝕
疲勞

中

撞擊
腐蝕

難

疲勞
附著

最難

淘刷
液化

腐蝕

下部支撐結構

Technology
Integration

技術整合

Local
Supply
Chain

本土供應鏈

- 結構設計須依照相關要求與標準
- 結構安全係數大造成安裝成本高
- 依風場設計建立結構的運維技術



- 離岸風場運維技術複雜成本高須針對風場條件建立因應技術
- 支撐結構多數遇到的損壞問題可從監測數據中的徵兆來發現
- 結構設計與製造時先預留監測的佈設固定機構以及走線孔位
- 研發計畫中發展出降低風險的可行技術並提早維護降低成本



知洋科技有限公司 **Awareocean Technology Co., Ltd.**

海洋設備 製造&整合 | 水下技術 諮詢&服務
Ocean equipment manufacturer & integrator
Underwater technology consulter & provider

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