

# Black sea fLoating Offshore Wind

## *Stakeholders workshop*

13-14 of September 2023

Hosted by Constanta Maritime University

WP3.5: Design of Onshore assembly and offshore installation

WP4: Pilot set-up

GSP Offshore

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# Outline



01

**WP3.5 Overview of Tasks**

02

**WP3.5 Overview of Deliverables**

03

**WP3.5 Next steps**

04

**WP3.5 Risks and mitigation actions**

05

**AOB**



## ➤ Task 3.5: Design of Onshore assembly and offshore installation

- This task aims to provide (1) onshore logistics specifications (means and planning) for the logistics dedicated to the manufacture and assembly of the 5MW floating wind turbine and associated components and (2) offshore logistics specifications (means and methods) for the installation, operation and dismantling of the wind turbine:
  - Marine cable installation operations
  - Marine anchor installation operations
  - Marine operations for the transit of the wind turbine to the on-site connection
  - Marine maintenance operations
  - Marine dismantling operations
  - Marine emergency operations



D n°	Deliverable2	Deadline	Type	Deliverable Lead	Reviewer 1	Reviewer 2
D43	D3.5 Update on the metocean specifications for wind database from the Galata platform	M32	DATA, PU	CMU	<b>IREC</b>	<b>DURED</b>

- Update on the metocean specifications for wind database from the Galata platform
- Monthly progress meeting
- Data gathering from GSP leader



## ➤ Task 4.1: Manufacturing & procurement

- The main objective of this task is Based on the outcomes of WP3, this task will aim:
  - (1) to manufacture the floating foundation, including its 4 pyramidal legs;
  - (2) to adapt a 5 MW offshore turbine to the disruptive floating structure. The modifications are located in the nacelle area. New parts will be manufactured to strengthen the turbine and attach it at both upwind and downwind sides;
  - (3) following the detailed specifications, to procure electrical equipment to safely connect the floating offshore wind unit to the oil & gas platform;
  - (4) to procure the mooring system, the mooring lines, the shackles, the anchors, the bottom chain lines, the submerged buoy (Single Point Mooring, SPM). All the components will be validated through Factory Acceptance Tests.



## ➤ Task 4.2: System Assembly, Deployment and Commissioning

- The main objective of this task is to install and connect electrical and mooring equipment, and to commission the floating unit.

(1) To safely ship the nacelle and blades to the harbour where the assembly will be performed.

(2) To safely assemble the float and the turbine onshore (quayside) as per methods of statements and procedures. Instrumentation and electrical connections are also performed at this stage, which is finalised with functional tests to confirm the performance of the floater-turbine assembly.

(3) To safely install the mooring system and power cable as per methods of statements and procedures.

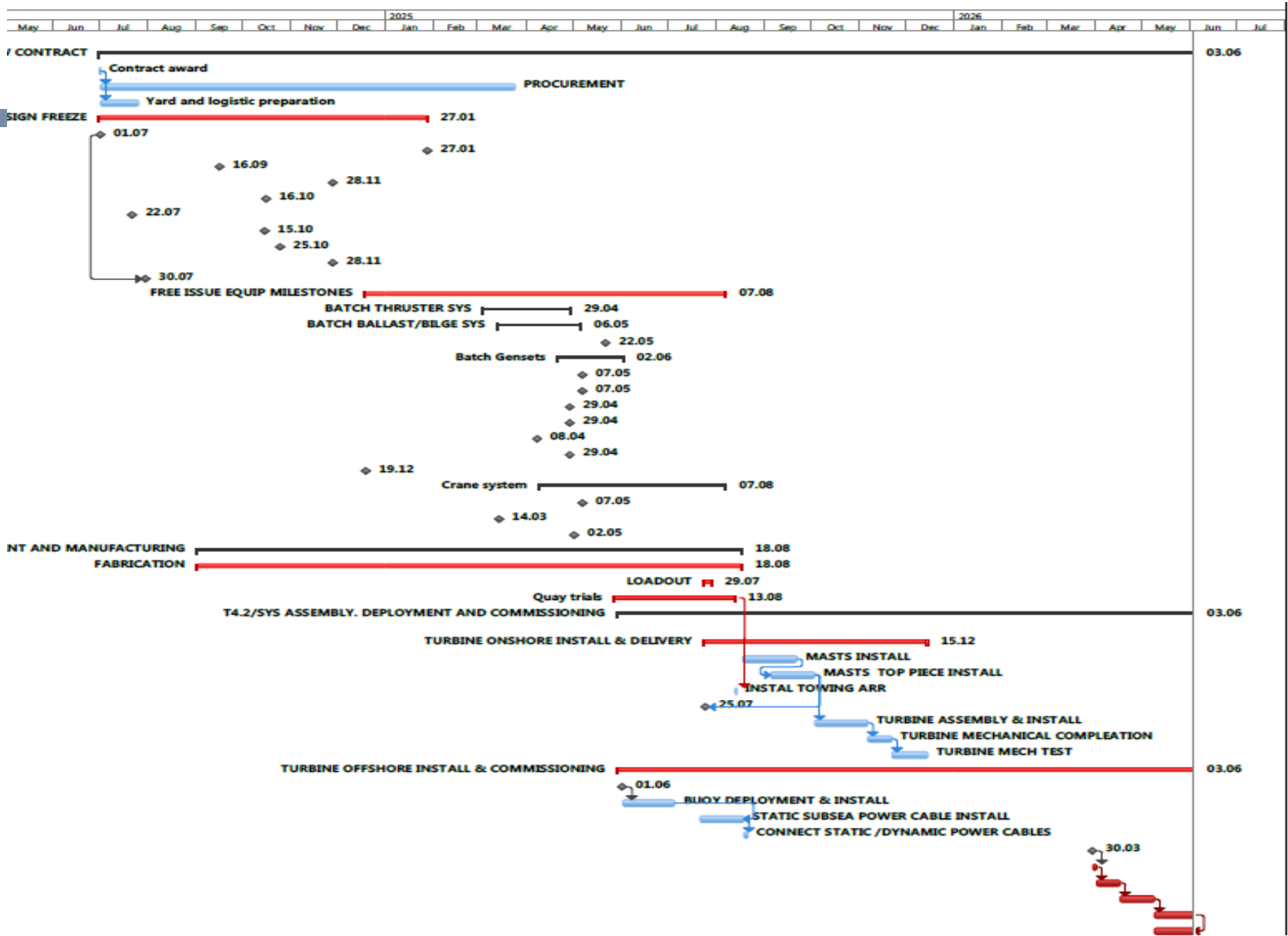
(4) To safely tow the turbine+float unit from the shipyard to the offshore site as per methods of statements and procedures.

(5) To safely hook up the floating unit to the mooring system and to connect the electrical cable.

(6) To commission the SPM buoy and the wind turbine.

WP	D n°	Deliverable2	Deadline	Type	Deliverable Lead	Reviewer 1	Reviewer 2
WP4	D14	D4.1 Report compiling the Factory Acceptance and the Site Acceptance tests main outcomes	M38	R, PU	GSP	<b>EOLINK</b>	<b>CMU</b>
WP4	D15	D4.2 Report on the fabrication and installation phase including return of experience: compiling the actual costs incurred, actual timeline and main events during construction	M40	R, PU	EOLINK	<b>BEIA</b>	<b>EMEC</b>







- Workshop Design and Production Info - based on the design documentation received from Contractor, build strategy information and shipyard standards
  - Basic design documentation
  - Equipment data
  - Rules and regulations
  - Contract documentation
  - Shipyard standards
  - Shipyard material system information
  - Shipyard production information
  - Design manuals
  - Architectural documentation

## ➤ Procurement Management System

- Timely and accurate identification of the goods and/or services needed and proper specifications of the purchased Products;
- Material Requests are issued and requirements & quality criteria for goods or services are clearly indicated;
- Material Request's are analyzed and approved;
- Suppliers are selected; offers technically & commercially analyzed and the most advantageous one is selected;
- Delivery of goods and payment to suppliers are to be monitored and followed up;
- Purchased products & services are counted and checked;
- Receiving of the supplied goods in the TRANSIT, CUSTODY and HOUSE Warehouses is subject to the completion of Customs procedures;
- Supplied products are transported/transferred from the TRANSIT, CUSTODY and HOUSE Warehouses to END USER units.



## ➤ Suppliers Qualification System

- procedure “GSP-COR-PRC-PRO-002 Evaluation and Selection of Suppliers” applied to all departments involved in supply process and in the activity of purchasing products, materials, works and services, relevant to the quality of the services provided by the company;

## ➤ Expediting Procedure

- The Purchasing and Expediting Officer will be part of the project team and he/she will subordinate to the Project Manager and coordinate the activities as per the project plan and execution. A Logistic and Custom officer is assigned to Project. The Purchasing and Expediting Officer keeps a close communication with the designated Logistic and Custom officer, advising on POs to be collected and providing all necessary information for the shipment required. The Logistic and Custom officer will initiate the checking of the documents and goods custom status and revert to the Purchasing and Expediting Officers and/or Supplier if any change or additional information is required for the custom formalities and/or shipment.

## ➤ Material Control System

- “GSPS-PRC-PRO-01 Purchasing of Materials and Processes”- services performed and materials purchased are verified and confirmed by the Service Provider and the Purchaser are accepted and received on the basis of the Materials / Service Reception Record Report
- Quality of delivered products / services
- Accreditation and authorizations



## ➤ Procurement Plan

- Material Management
- Objectives
- Organization and Responsibilities
- General
- Purchasing
- Expediting
- Supplier Quality Surveillance
- Traffic and Logistics



## ➤ Storage management

- “GSP-SHY-FAB-PRO-003 Materials Storage and Preservation” covers all issue related to the receipt and goods movement once in property, use or custody of the company: receipt, warehousing, release and return
- assurance of the materials quality purchased or held in GSPS warehouses or shipyard, by protecting them against damage or loss during handling, storage, retention and release



## ➤ Preparation work and general layout construction

- Establish the building strategy and fabrication flow
- Lifting/load-out plans for all fabrication stages
- Marking of the designated areas inside/outside according with fabrication flow
- Maintenance/service program for tools and equip
- Procedure for transport&storage of free issued items
- HSEQ management Plan related to the project
- List of welding procedures and their area of application including heat treatment procedure, if applicable
- Welding plan showing unambiguous member identification and weld marking



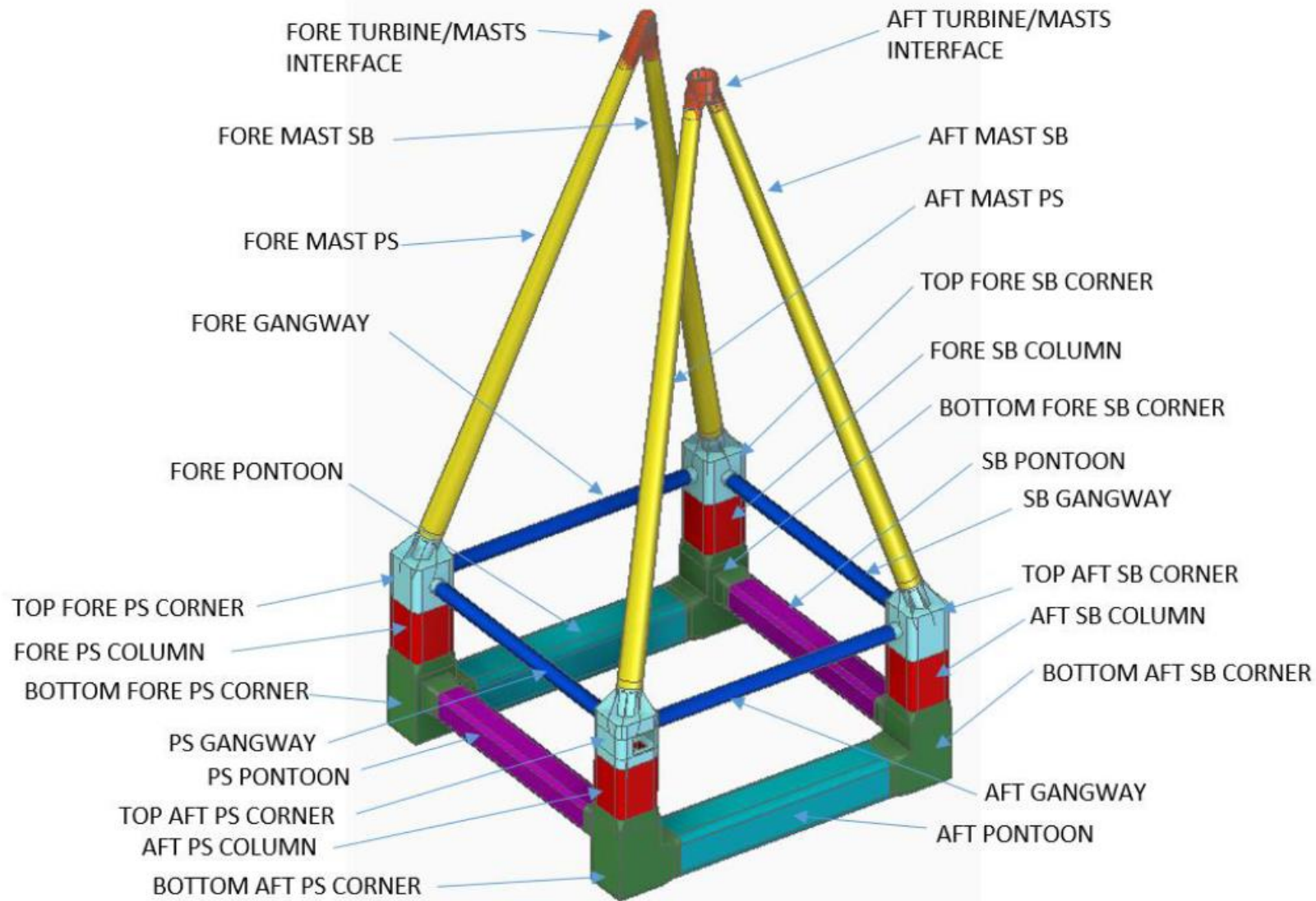
## ➤ Preparation work and general layout construction

- Identification and material control/traceability procedures
- Procedures for control of dimensional tolerances during fabrication, these procedures shall specify all stages for checking tolerances for each sub assembly and during erection
- Assembly and erection procedures and major lifting and load-out procedures
- Testing procedure (leak testing, hydrostatic testing, functional testing)
- Detailed NDT procedures
- Procedure for installation of free issued supplied materials
- Painting procedure and specification



## ➤ Main Blocks Construction

- Steel material shipping
- Cutting, fitting, welding and assembly of steelwork.
- Blasting and painting
- Installation of cable tray, ladder racks and supports.
- Installation and connecting of cables
- Prefabrication of piping spools
- Installation of piping, fittings and supports.
- NDE test for welding as per defined structure category
- Installation and hook-up of Free Issue Items.
- Final assembly
- Commissioning support and final tests according Fabrication Specification requirements





## ➤ Structural Work

- Work Preparation
- Pre-Fabrication
- Assembly
- NDE and Shop TEST
- **BLASTING and PAINTING**



## ➤ Description of production capacity of the yard

### Access to Open Sea:

- Distance to open water - 6 km
- Minimum Channel Water Depth - 7 meters
- Minimum Channel Width - 160 meters
- Height Restrictions – None
- Tidal Range Negligible

### New built construction & Assembly hall -3 000 sq. m.:

- Production area 2 250 sq. m.
- 2 x (20 + 5) ton gantries

## ➤ Description of production capacity of the yard

New built yard quarter - 900 sq. m.

Steel fabrication area:

- Crushed stone pavement area - 34 000 sq. m - maximum allowable load - 30 tons / sq. m
- Pile reinforced area - 2,400 sq. m - maximum allowable load - 200 tons / sq. m
- Concrete pavement - 9,400 sq. m - maximum allowable load - 30 tons / sq. m

Special Equipment

- Combirex DX 4000 (Oxy-fuel and Plasma cutting - Max Plate Width – 10' (3m), Max. Cross Travel with 4 tools – 122'' (3100 mm), Machine Width – 201.8'' (5125 mm), Speed Range – 2-1000 ipm (50-25000 mm/min )

Suprarex SXE P-3500 (Pipe dia. - Min. 219mm - Max 890 mm; Max. thickness - 32 mm; plasma cutting)

## ➤ Organization and structure of the yard



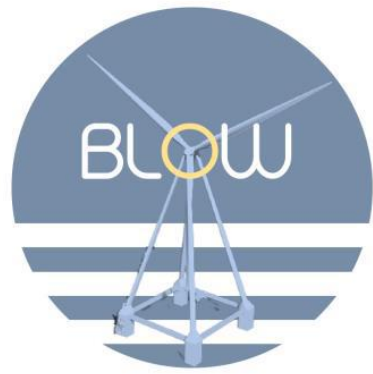


- Description of dimensions and type for prefabrication, painting and temporary plants areas, offices, warehouses  
New built yard quarter - 900 sq. m.

	Open sq.m.	Covered sq.m.
Warehouse for particular material e.g. instruments, electrical parts.	1200	2633 mp
Warehouse for standard bulk material	10500	
Structural steelwork prefabrication workshop	15000	2240
Assembly area	12000	1600
Painting areas	800	864
Office areas		1700



- Primary steel construction;
- Secondary steel construction;
- Ancillaries implementation;
- Quality checks and inspection are performed all along the manufacturing process;
- Final test checks are carried out in closed seas to ensure that the expected performances (steel weight, stability) are met
- The nacelle of the turbine is dismantled and the new parts are ordered: fixed shaft extension (A), machining a hole in the front side of the hub (8), new larger slip rings, new seals, upwind fastener (D);
- New slew bearings and new main bearings are installed.;
- Modified components of the turbine are integrated and tested in order to verify the performances of the turbine prior to the assembly of the rotor.



# Thank you for your attention!



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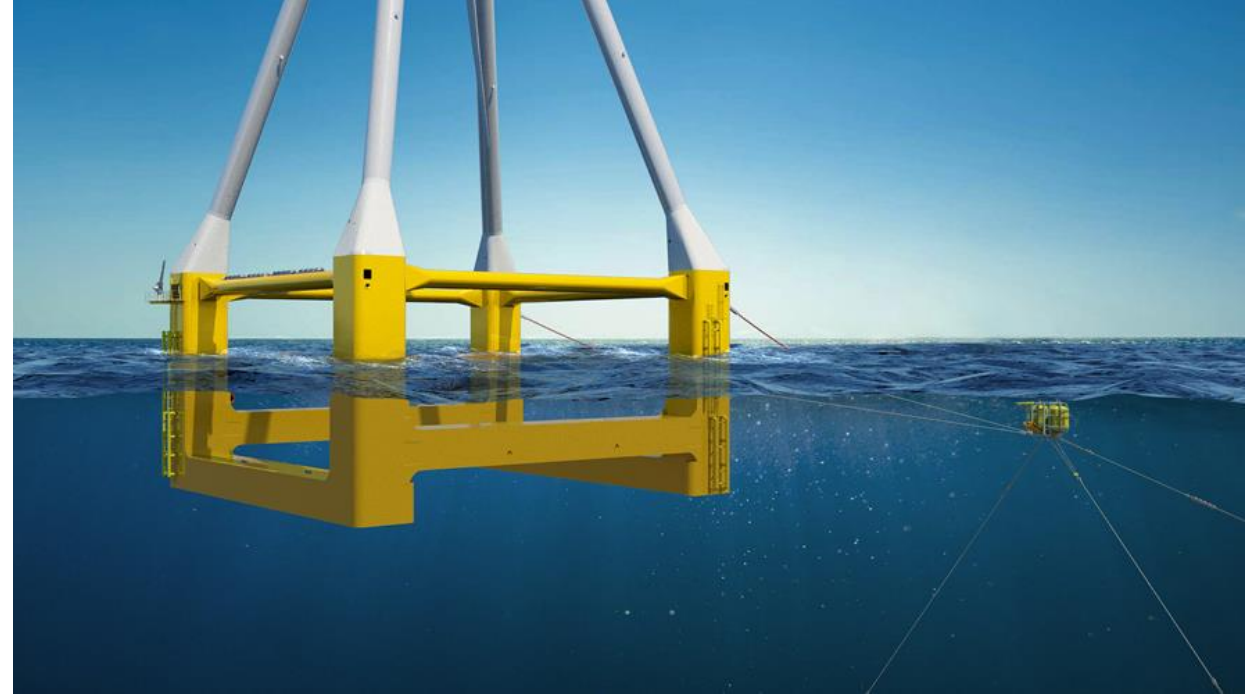
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