

INSTALLATION OF TWO DEEPWATER FPSO MOORING SYSTEMS IN A SINGLE INTEGRATED CAMPAIGN

ACTEON



MOORINGS AND ANCHORS

Acteon companies join forces and successfully install driven foundations and mooring lines for two FPSO offshore china.

THE PROBLEM

InterMoor, an Acteon company, was contracted for the provision of engineering and offshore services for the installation of 16 mooring lines to a semisubmersible floating production unit (FPU) offshore China.

At the same time, they were also contracted for the hook-up of a turret-moored floating production and storage and offloading vessel (FPSO). The mooring system of that FPSO comprises nine suction pile anchors with chain-wire-chain legs.

Challenges were both technical and logistical:

- Technical requirements including large mooring components (156mm chains, 256mm polyester ropes and associated connectors) and tight installation tolerances for two simultaneous installations in deep water.
- Logistical pressures including changing vessel availability and scheduling, language and cultural barriers, and global supply chain, some of those aggravated by the Covid-19 pandemic – vessel flag restrictions, remote working, lack of flight schedules and delays in mobilisation of personnel.

THE SOLUTION

Optimised engineering to reduce project footprint

The engineering solution provided by InterMoor focused on saving onshore and offshore time.

First, the mooring chain was stored in bundles on a barge maximizing t/m² usage, minimizing space requirement, and preventing storing the chain on the quayside or in a storage area.

Then, detailed methodology was developed to upend and lift the 500kJ MENCK hammer on deck and transfer it from starboard side to port side. Engineering procedures and analysis were developed for vessel movement and subsea deployment in deepwater using the main crane.

To save offshore time, InterMoor developed a detailed methodology to optimize transfer of the 16 mooring piles from

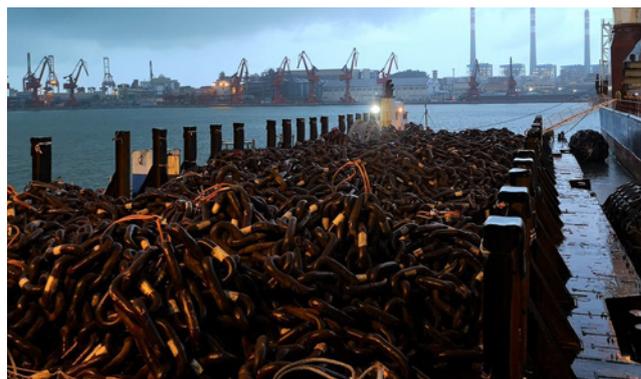
a barge directly to the main installation vessel. The team also designed customised installation aids for the installation of the piles, as well as bumper guides to facilitate offshore reel changeout and optimise offshore weather window requirement during operations.

Build on established track record

The crew was able to build upon their permanent mooring track record and familiarity in handling chain and mooring components of this size. InterMoor's engineering team responded promptly to changes in schedule and met deadlines by working around the clock during the engineering and offshore phases to resolve all challenges efficiently, ensuring that the operations continued smoothly. Various contingency plans were prepared and added to mitigate the risks. Engineering constructability reviews and risk assessments were performed in response to schedule and vessel changes. The engineering procedures and analysis were developed to mitigate the risks of subsea deployment of piles and hammers and all mooring line components in this water depth.

Leverage local content

InterMoor was able to respond to changes and requests by leveraging the span of Acteon personnel across the globe, mobilising 23 staff from nine countries for both the onshore and offshore scopes. They also shortlisted additional personnel as backup. They were also able to tap into Acteon's strong and supportive network of local agents, clients and sister companies in Singapore and China to assist with paperwork and closely monitor the dynamic border and visa requirements, enabling personnel to be deployed in a timely manner. Close communication with all stakeholders, especially the client, was essential and a local language speaking team member facilitated communication. Having done previous work in China helped in understanding the working culture and dynamics. InterMoor integrated their team with the client's office in China, to ensure seamless interfaces with the client, the operator, and the subcontractors.



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THE RESULT

InterMoor completed the offshore campaigns safely within the revised schedule for one project and ahead of schedule for the other. Acteon companies InterMoor and MENCK worked together seamlessly to install the mooring system. InterMoor provided an engineering and project management single interface for the client and utilised LM Handling pile installation equipment. The seamless integrated approach simplified the tender process and ensured a single point of contact for the client, resulting in an overall faster, smoother, and successful delivery.

Acteon companies involved:

InterMoor	Offshore crew, project management, and engineering
MENCK	Provision of pile hammer equipment
LM Handling	Pile installation equipment

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