

The background of the entire page is a 3D rendering of an offshore wind turbine installation. A large, dark brown, cylindrical monopile is being lowered into the sea by a floating vessel. The vessel's deck is visible, showing various equipment, including a white crane with red accents and a yellow lifeboat. The text 'IOIP DYNAMIC OUTRIGGER FRAME' is printed on the side of the vessel. In the background, several other wind turbines are visible on the horizon under a blue sky with light clouds. The water is dark blue with white foam from the vessel's wake.

Dynamic Outrigger Frame

Facilitating monopile installation from floating vessels

Dynamic Outrigger Frame

Facilitating monopile installation from floating vessels

The Dynamic Outrigger Frame (DOF) is designed to facilitate the installation of monopile foundations for wind turbines from floating heavy lift vessels. Featuring a Dynamic Positioning system, the DOF maintains positioning to ensure correct pile position, orientation and verticality during the pile driving process. Without the need to deploy anchors to maintain vessel position, using DOF reduces foundation installation cycle time.

Built on experience

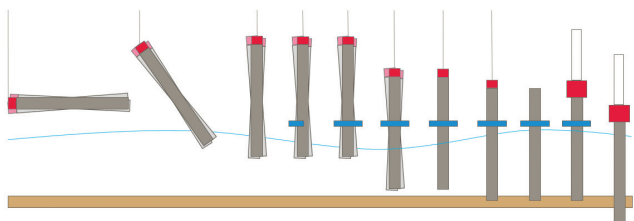
Iqip has an extensive track record with monopile handling, pile driving and motion control. Our equipment has installed >5.500 Monopiles in >80 projects. With all disciplines and expertise in-house, iqip is in a unique position to provide the dynamic outrigger frame from concept right through to actual design, build, delivery and operation.

Increased safety

The stable and reliable operating system can ensure that operations continue, even in severe conditions. In the unlikely event of a failure, the system will enter a safe mode and follow fall back scenarios which are defined with the help of extensive fmeas.

Increased efficiency

The dynamic outrigger frame can deliver a total of 30% to 40% cycle time reduction per monopile installation compared to traditional installation methods.



From concept to realisation

To help facilitate operations, iqip has developed an integrated simulation model of the complete monopile installation sequence which includes all relevant real world systems and parameters. The simulation model validates our technology and provides a good basis to check project design parameters such as loads, stroke and speed, in combination with a mechanical concept tailored to each project. The simulation model is used to evaluate the gripper performance in combination with the vessel and dynamic positioning system performance, which results in increased workability. The simulation environment is also used throughout our projects to define parameters for detailed design, the basis for the control system, platform for testing, training and life cycle support.

Our specialised in-house product development has led to several patent pending innovations, for example, the ability to safely catch the swinging monopile with the gripper, accurate

positioning on the target location, and the ability to deal with a wide range of soil conditions during pile driving.

Options

- XY compensation stroke, speed & force increase
- Monopile diameter increase on request
- Diesel driven autonomous HPU
- Noise mitigation system
- Operator training simulator

General	
Water depth (typical)	15 - 60 m
Operational Hs	2.5 m
Monopile typicals	
MP diameter	6 - 12 m
MP length	110 m
MP weight	1500 - 3500 Mt
Motion compensation	
Compensation stroke	+/- 3.0 m
Compensation speed	0.70 m/s
Load	350 Mt
Installation tolerances	
Horizontal deviation	1 m
Vertically	0.2 degrees
Pile orientation	2.5 degrees
Level of MP top	0.1 m

