



FRANKLIN OFFSHORE

FRANKLIN MOORING SERVICES

2023 . I



WHO WE ARE

A World-Class Company

The Franklin Offshore Group is a leading integrated provider of quality rigging and mooring equipment and services to the offshore construction, oil, gas, exploration, production and renewable energy industries.

We provide operational excellence and promote the high quality Franklin brand of products and services to complete our global presence.

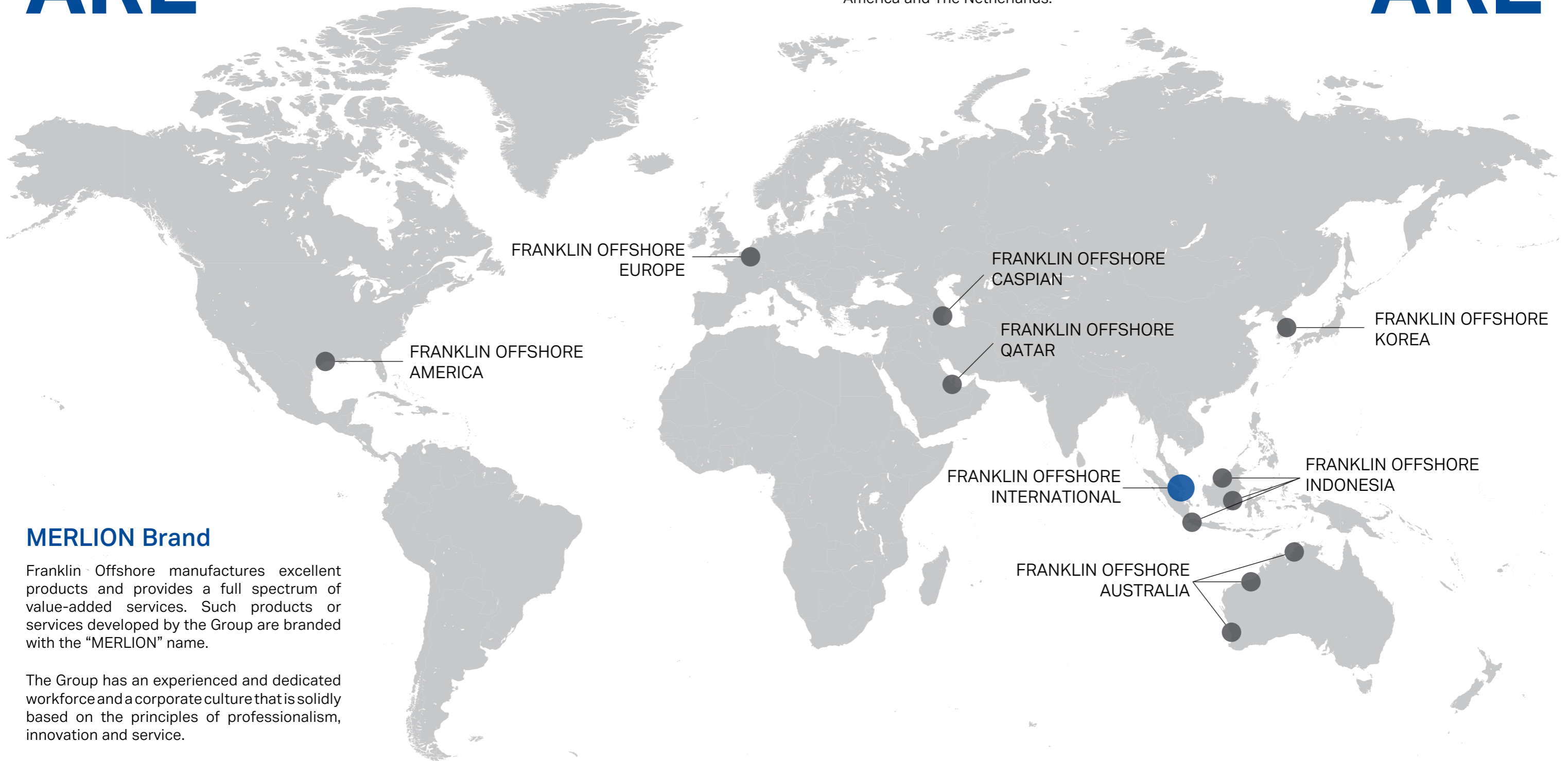
We provide a comprehensive integrated solutions for our customers' Rigging, Mooring and Inspection requirements.

Global Reach

Franklin Offshore is a leading global provider of steel wire rope and all types of rigging and mooring equipment complete with added value support services to the onshore / offshore construction, oil, gas exploration, production and renewable energy industries.

Established in 1985 in Singapore where it is headquartered, the Franklin Offshore Group has a global presence covering Australia, Indonesia, South Korea, Azerbaijan, Qatar, United States of America and The Netherlands.

WHERE WE ARE



MERLION Brand

Franklin Offshore manufactures excellent products and provides a full spectrum of value-added services. Such products or services developed by the Group are branded with the "MERLION" name.

The Group has an experienced and dedicated workforce and a corporate culture that is solidly based on the principles of professionalism, innovation and service.



Quality Assurance and Quality Control

Quality Assurance (QA) is our commitment to providing a quality product or service, first time every time. Our QA system is DNV GL Approved and our business depends on our reputation and the quality of our products and services that we provide.

We are totally committed in today's competitive environment, that our clients receive the utmost highest level of quality in our products and services to ensure safe and reliable operations in the offshore rigging and mooring industry.

Quality is a part of our heritage. During a long, rich history, Franklin Offshore has established an exceptional track record for the supply of both high quality proven products and supporting services. These relates to the expertise and commitment of our management and staff and the best practices that we have established in our procedures. We are totally committed to the delivery of our products and services to meet if not exceed our clients expectations on time, every time and within budget.

Our Vision: To be the Best

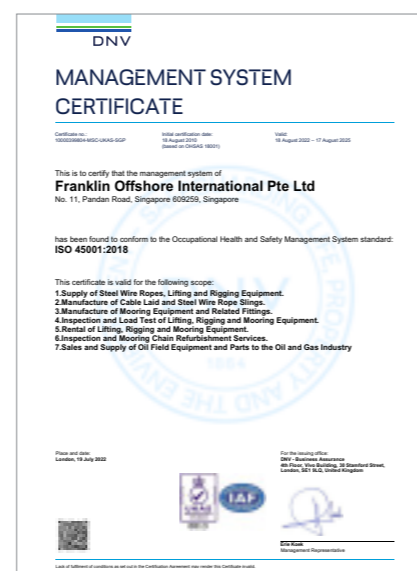
To be acknowledged by our clients, our staff, and our shareholders, as the leading integrated provider of rigging or mooring equipment solutions complete with technical support services globally.

Management System Certificates

ISO 9001:2015

ISO 14001:2015

ISO 45001:2018



Franklin Mooring Services

A global leading integrated solutions provider for temporary and permanent moorings. Regardless of water depth, mooring requirements and component requirements, Franklin Mooring Services provide a unique opportunity for customised and cost-effective solutions.

Our services include:

- Initial Feasibility Studies
- Engineering FEED Studies
- Mooring Analysis
- Design and Engineering
- Equipment Rental and Sale
- Fabrication
- Conventional and Preset Mooring
- Installation, Engineering, Crew and Supervision
- Temporary and Permanent Mooring
- Maintenance, Repair and Replacement
- Recovery
- Rig Move
- Riser Analysis

Planning / Personnel

Franklin Offshore employs experienced project engineers, naval architects, project managers and marine superintendents. We believe in teamwork and in detailed planning for successful project execution that meet or exceed our clients expectations.





Engineering Resources

Supported by the latest software programs, Franklin Mooring Services offer a wide range of engineering and design solutions, which include:

- Ballasting Analysis
- Ballast Plan
- Cost and Feasibility Analysis
- Drafting Services
- Dynamic Lowering Analysis
- Hydrodynamic Characteristic Modeling
- Installation Engineering
- Mooring Operations
- Quasi-Static and Dynamic Analysis (For Integrated Mooring and Riser)
- Risk Assessment Analysis
- Station Keeping Analysis
- Stress Analysis

Inventory

Complete preset mooring systems, single components, wire rope, polyester rope, spooling machines, and other equipment are kept at our locations, thus ensuring fast response and short delivery time.



Temporary Mooring

With our global reach, we are able to provide and install our Franklin Mooring Systems in the world's leading offshore exploration and production regions - including shallow and ultra deepwaters across Asia, China, and the West Africa regions.

Our experience in deepwater mooring has helped us develop a mooring system that is robust and that satisfies both industry and regulatory criteria.

Mooring Equipment

Our inventory includes all types of mooring equipment available for rental or direct purchase. Steel wire ropes, anchor chain, buoys, synthetic tethers, anchors, and a complete range of jewelry to connect the different components together. The equipment is certified and controlled within our QA/QC management systems.

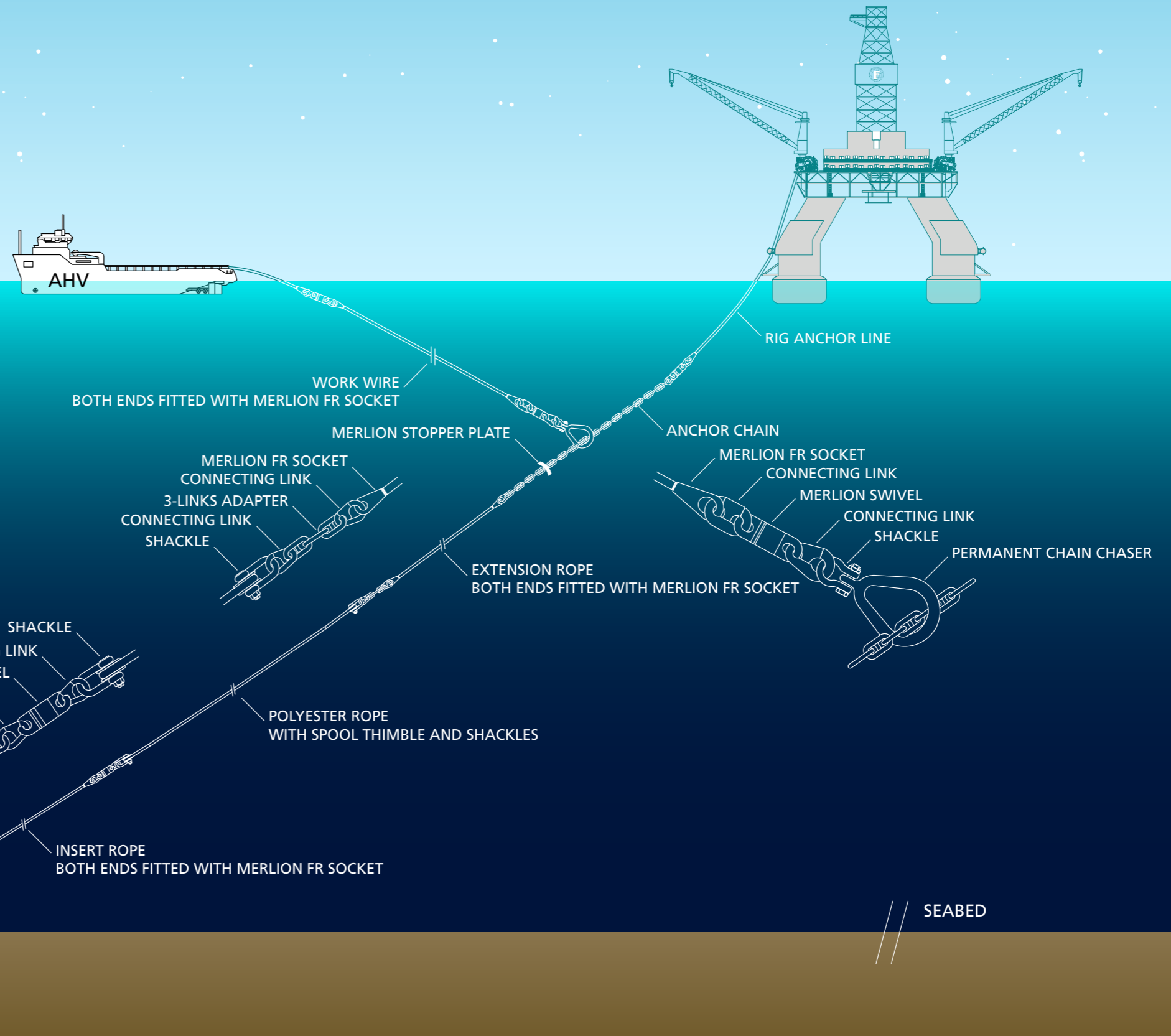
Spooling Machines

Our tough and robust spooling units are multi purpose in regards to the reel sizes and have the capacity to provide back tension in regards to carrying out rope spooling safely and without damage.



TEMPORARY MOORING

We are acknowledged as a global leader in the supply of integrated comprehensive solutions for temporary moorings. Regardless of water depth, mooring requirements and component requirements, Franklin Mooring Services provide a unique opportunity for customised and cost-effective solutions.



Deployment & Retrieval of Temporary Mooring Systems

Our mooring supervisors are equipped to provide a full spectrum of support services such as rig moves. Turnkey support services include the establishment of mobilisation plans, mooring equipment deployment and retrieval procedures.

Rental or Direct Purchase

We can provide a total turnkey solution for a pre-laid mooring system. From the anchor line to the anchor, we are the one-stop shop.

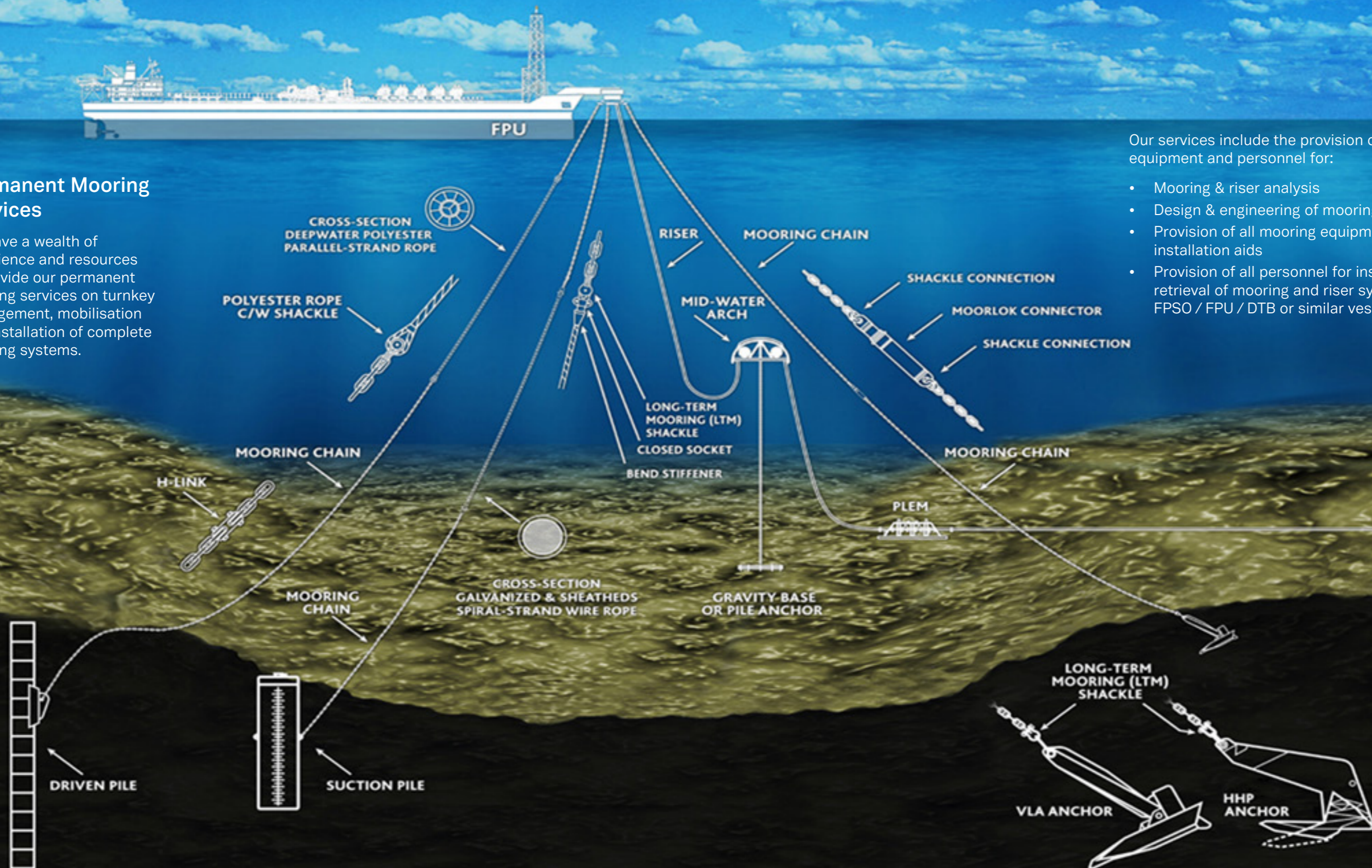
PERMANENT MOORING

Permanent Mooring Services

We have a wealth of experience and resources to provide our permanent mooring services on turnkey management, mobilisation and installation of complete mooring systems.

Our services include the provision of expertise, equipment and personnel for:

- Mooring & riser analysis
- Design & engineering of mooring system
- Provision of all mooring equipment and installation aids
- Provision of all personnel for installation and retrieval of mooring and riser system for MODU / FPSO / FPU / DTB or similar vessels



FLOATING OFFSHORE WIND MOORING SYSTEMS

Innovative Solutions for Offshore Floating Wind Mooring

Offshore wind power is one of the fastest-growing renewable energy sectors, attracting substantial interest and investment globally.

All floating wind turbine technologies share a common challenge, that the platforms need to be held firmly in place with a robust mooring system in a cost-effective way. High-quality mooring foundations are of critical importance. The harsh marine environment, erosion and high wind speeds can all shut down the turbine if the foundation is not strong enough.

Global mooring systems can be designed as follows:

The mooring system (mooring lines and anchors) guarantees the safety of the installation and, together with the floating platform, builds a complex mooring configuration. The following are the most common mooring system installations.

Catenary mooring systems

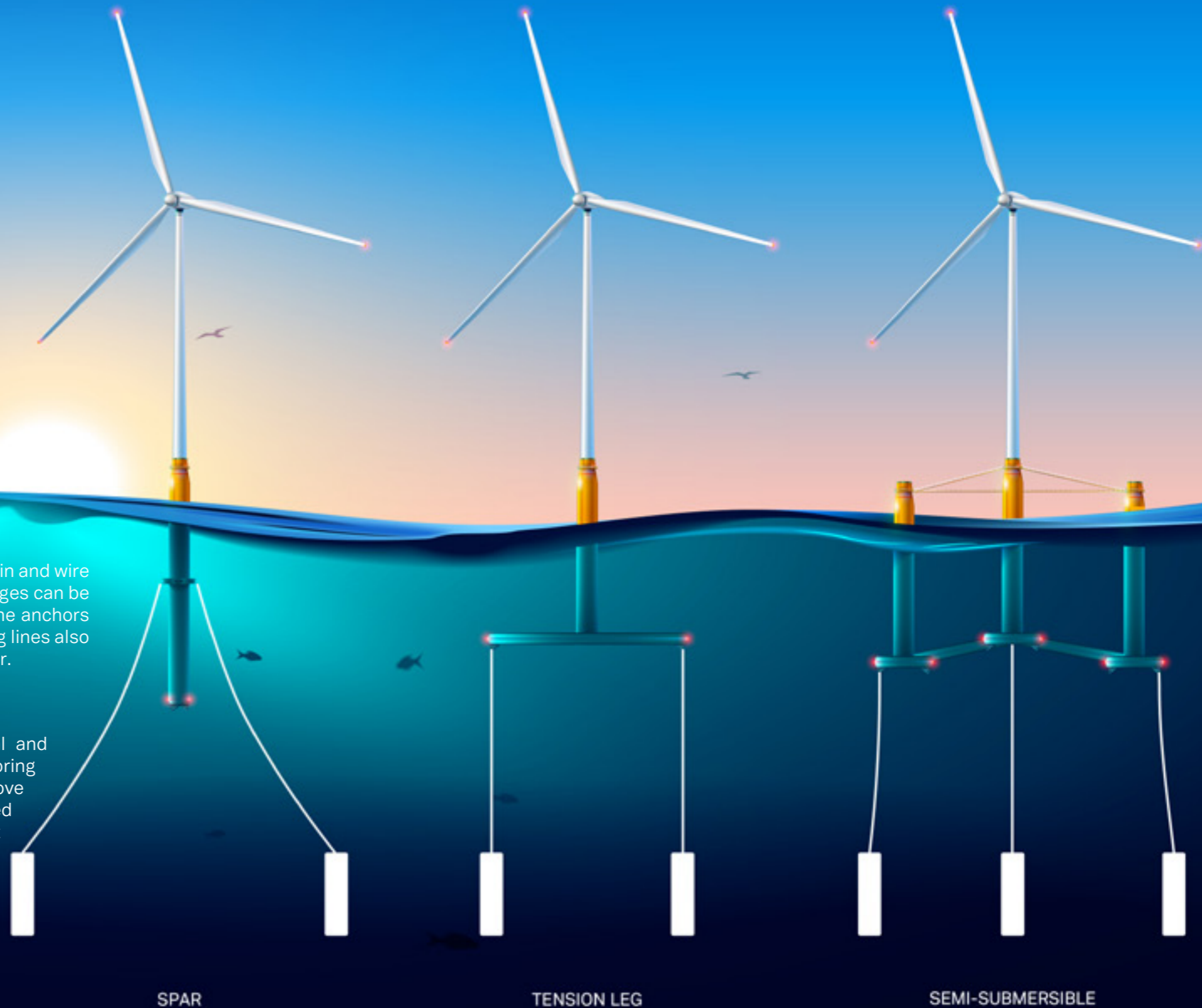
CMS systems can be deployed in water depths of up to 100 meters, and combine chain and wire ropes. The system relies on its own weight to provide restoring forces. Its disadvantages can be increased production costs and greater vertical loads; the main advantage is that the anchors are only subjected to horizontal forces. However, increasing the length of the mooring lines also increases their weight so catenary systems become less economical in deeper water.

Taut leg mooring systems

In depths beyond 100 meters, the weight of the mooring line becomes critical and encourages the adoption of Polyester and Dyneema type ropes for taut leg mooring systems. These are light and flexible, can provide large restoring forces, and improve the drilling condition and energy density (MW/km²) by reducing the spacing required between units. The disadvantage is that the anchors need to handle a significant vertical force, which would increase the stiffness and impact on the dynamic behavior of the floater.

Semi-taut mooring systems, combining taut and catenary lines, are mainly used in deep-water applications. The spread mooring system consists of a group of mooring lines distributed over the bow and stern of the platform. This is a relatively flexible solution suitable for most water depths.

Hybrid systems, consisting of buoys and catenary lines, are also available.



FLOATING OFFSHORE WIND MOORING SYSTEMS

Mooring in Extreme Conditions

The performance of the mooring system needs to capture the technical and environmental objectives required when designing a mooring system.

They can include:

- Extreme wind conditions
- Wave behavior
- Currents and tides
- Marine growth

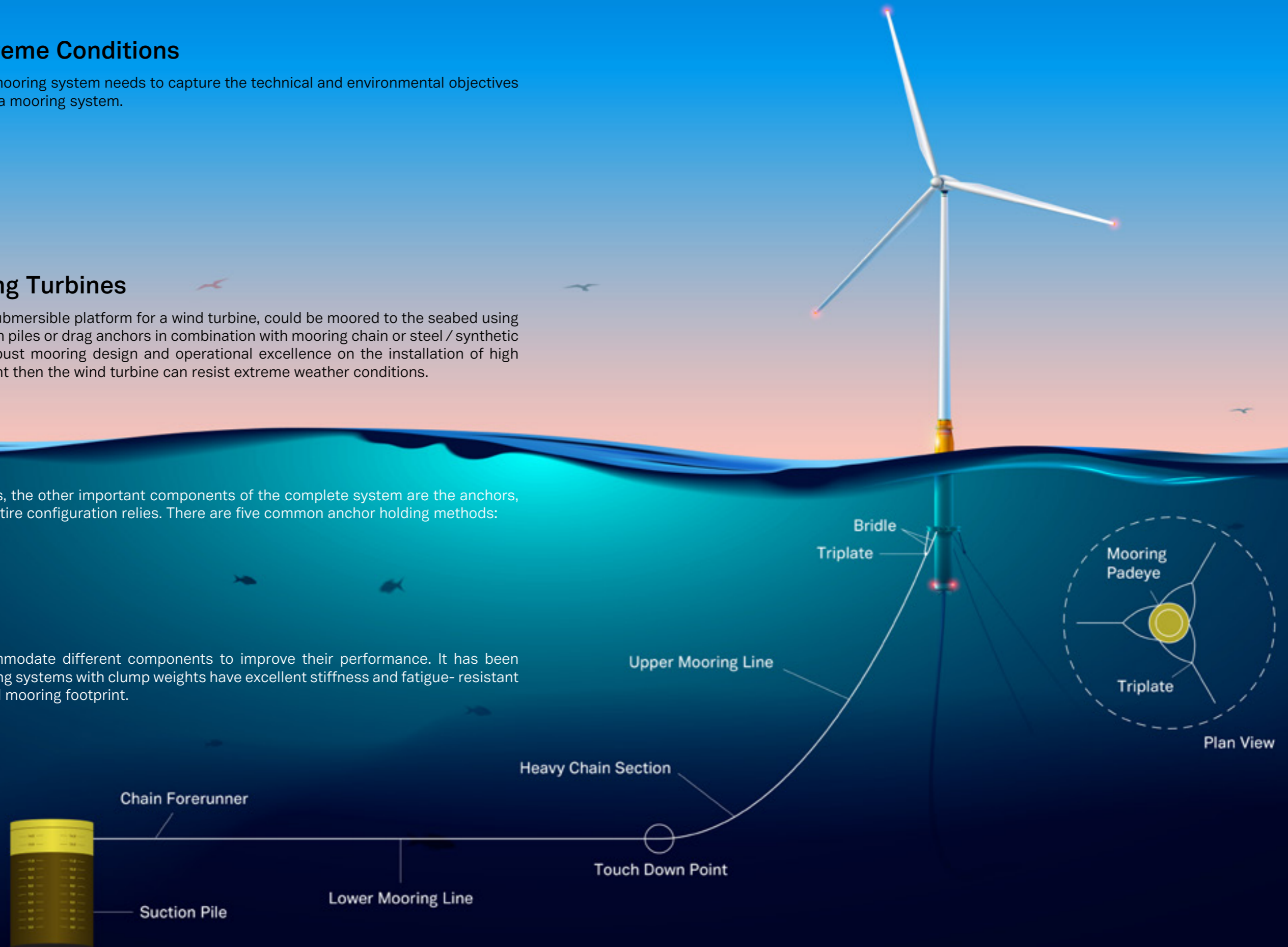
Mooring Floating Turbines

Example: SPAR or Semisubmersible platform for a wind turbine, could be moored to the seabed using either suction piles, driven piles or drag anchors in combination with mooring chain or steel / synthetic mooring lines. With a robust mooring design and operational excellence on the installation of high quality mooring equipment then the wind turbine can resist extreme weather conditions.

Besides the mooring lines, the other important components of the complete system are the anchors, on whose strength the entire configuration relies. There are five common anchor holding methods:

- Clump weight
- Drag embedment
- Driven piles
- Suction type
- Vertical load

Mooring lines can accommodate different components to improve their performance. It has been demonstrated that mooring systems with clump weights have excellent stiffness and fatigue-resistant properties with a reduced mooring footprint.





In-Field Removal and Replacement Solutions

The EPCI scope of work for these types of projects may include:

- Project management and planning including safety and hazard analysis
- Engineering, including design of the replacement mooring lines and produce all procedures conforming to classification/warranty surveyor requirement
- Procurement, supply and transportation of replacement mooring equipment and non-permanent material
- Constructability engineering including load and anchor leg strength modeling and analysis
- Installation phase of removal of existing mooring system and replace with new system



Mooring and Riser Engineering, Installation and Commissioning

Franklin Offshore has developed a successful track record in the engineering analysis, installation, and commissioning of flexible risers.

FSO Ratu Songkhla is designed for 20 years of service life without the need to drydock. The mooring system is a 9-legged mooring chain, external turret mooring system configuration that is mounted on the vessel bow. The condensate import system is one length of 8-inch unbonded flexible riser connecting the PLEM to the turret. Water depth is 61m.

Global alliances and our in-house capabilities enable us to provide a full spectrum of permanent mooring equipment. We can either fabricate the equipment used in the permanent mooring system or source it externally.



Engineering and Fabrication

Our subsidiary CFE Engineers is a leading service provider of engineered steel platforms and structural fabrications, in particular suction pile construction.

CFE Engineers has accreditation by DNV GL and has a world class infrastructure with our own quayside manufacturing facility that enables us to complete items ranging from a swivel to an oil rig module and to carry out mobilisation of our fabricated items.

Fabrication Services include:

- Engineering
- Project Management
- Procurement
- Customized Steel Structures
- Precision Machining
- Piping
- Electrical Installation
- Instrumentation Installation
- Refurbishment Work

Infrastructure

Our fabrication facilities are well equipped and can meet the most exacting requirements. Our project teams consist of highly-experienced engineers, technicians and skilled craftsmen that are able to design and fabricate large-scale and exotic special equipment.

We are fully committed to providing high-quality products and services to be your one-stop shop solution.



500 Tonne Chain Tensioner

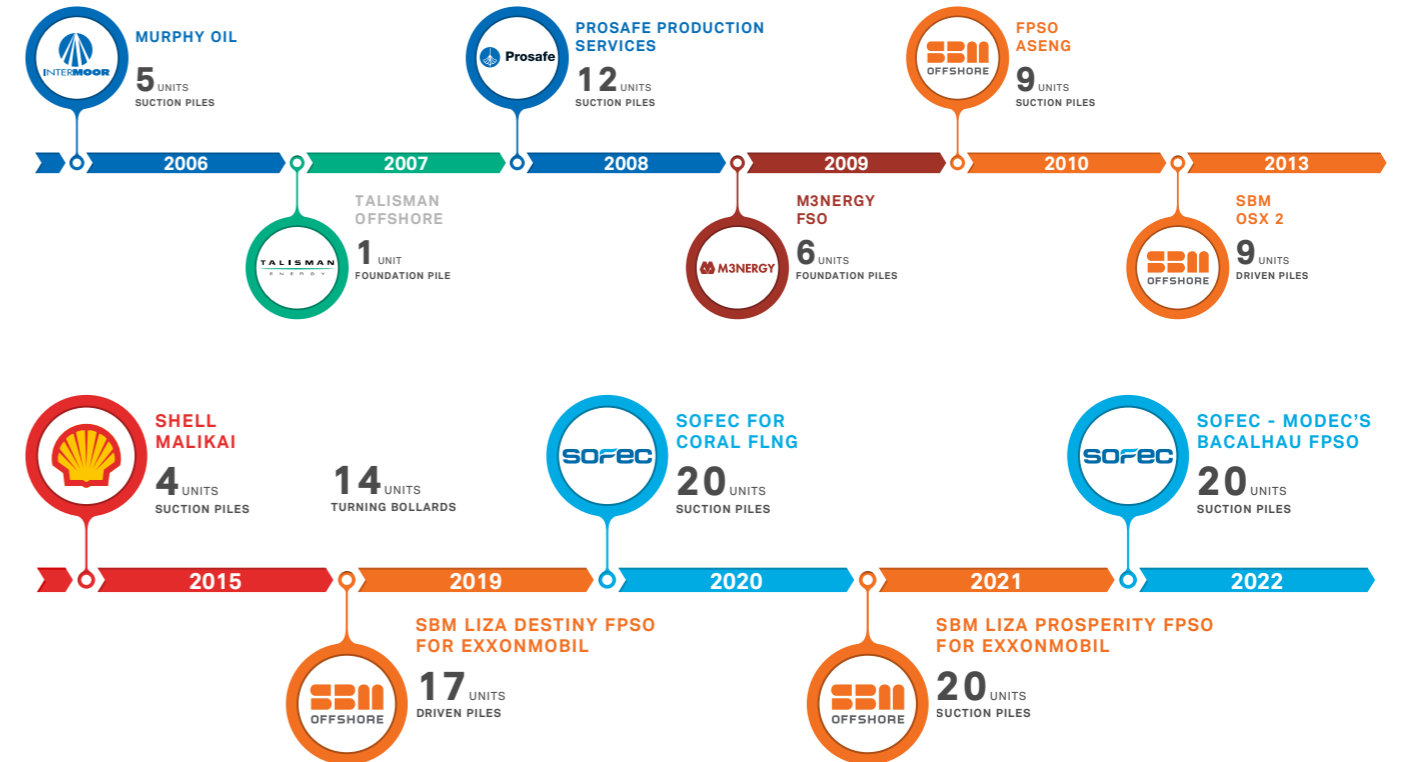


600 Tonne Spooling Machine



400 Tonne Single Drum Winch

Suction Pile Construction Track Record



Inspection and Certification Services

A mooring system can range from a simple single rope holding a small boat to a deep water mooring system complete with anchors, ground chain, swivels, tri-plates, anchor lines and buoys.

We have the experience and detailed work methods to carry out full inspection and fit checks of all types of mooring systems prior to their deployment.

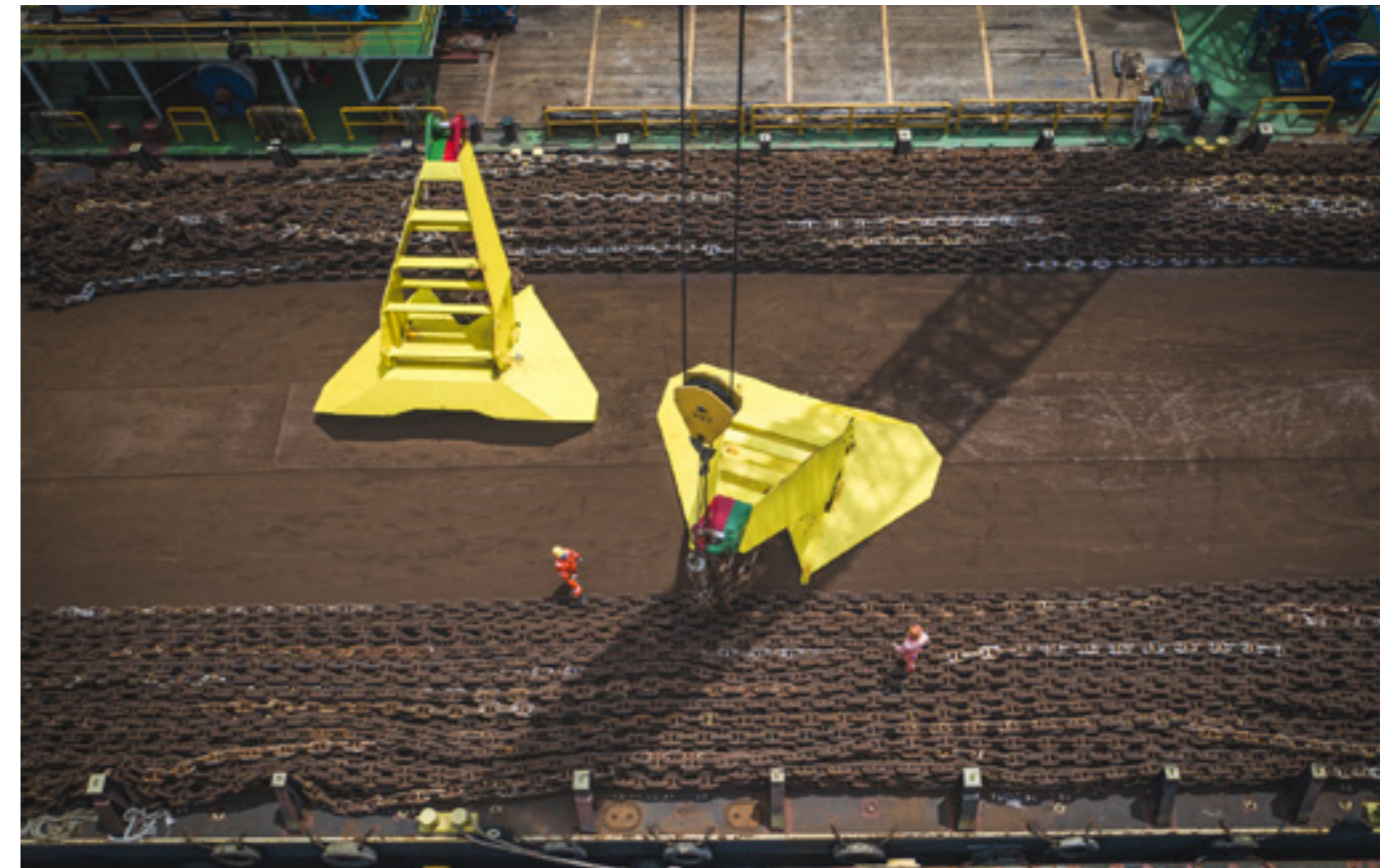
We are able to further provide a computer aided drawing (CAD) in our inspection report which clearly identifies the position of each component used within the system.



Magnetic Particle Inspection

Specific Work Methods

- FO/WM/M/001 - Standard Anchor
- FO/WM/M/002 - HHP Anchor
- FO/WM/M/003 - Normal Load Anchor
- FO/WM/M/004 - Mooring Anchor Line
- FO/WM/M/005 - Baldt, Kenger & Pear Link
- FO/WM/M/006 - Open Link
- FO/WM/M/007 - Totally Enclosed Swivel
- FO/WM/M/008 - Open Swivel
- FO/WM/M/009 - Anchor Sockets
- FO/WM/M/010 - Mooring Winch
- FO/WM/M/011 - Anchor Shackle
- FO/WM/M/012 - Buoy Pigtail
- FO/WM/M/013 - Synthetic Fibre Ropes
- FO/WM/M/014 - Mooring Buoys
- FO/WM/M/015 - Mooring Buoy Pigtails
- FO/WM/M/016 - J-Chaser / Grapnel
- FO/WM/M/017 - Mooring Chain
- FO/WM/M/018 - Delta Plate
- FO/WM/M/019 - Chain Buoy Pigtail
- FO/WM/M/020 - Wire Rope Clamp



L-BOW

THE L-BOW PROVIDES AN INNOVATIVE WAY OF TRANSFERRING
OFFSHORE PERSONNEL MORE EFFICIENTLY IN TERMS OF
SAFETY | TIME | FLEXIBILITY | INVESTMENT





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