



Module handling system for riserless light well intervention

The module handling system (MHS) is specifically designed to deploy and retrieve advanced equipment to facilitate subsea well intervention work in a highly accurate, safe and reliable manner. Key pieces of offshore well intervention equipment include subsea intervention lubricators (SIL) and subsea Christmas trees.

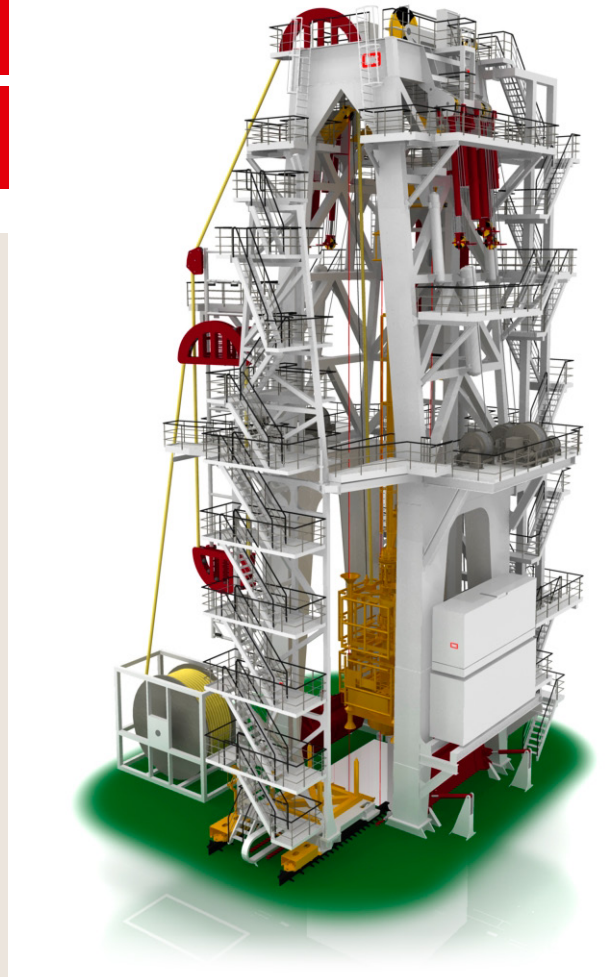
The MHS consists of an integrated steel tower construction, which supports the systems for handling of the subsea equipment. It is easy to work with thanks to an advanced control system and strategically placed operator positions.

The operating principle is such that an SIL assembly can be stored fully assembled and tested on a pallet on the parking position, reducing the work to be carried out offshore. For the lateral support of the SIL assembly, a support structure with access platforms is installed on the pallet. When the SIL is brought above the moon pool, it is subsequently lowered through the splash zone and to the seabed. Four guide wires connected to the subsea asset prevent unwanted movement. In the vessel moon pool, guidance is provided by two cursors minimising uncontrolled motions.

Two pod-line systems safely guide the SIL control umbilical and kill line to the seabed. The pod- and guide-line winches are provided with active heave compensation functionality to achieve a swift and safe landing as well as disconnection.

All safety-critical passive heave compensation systems are ATEX hazardous zone rated, sufficient to ensure the vessel motions remain accommodated for well intervention operations, with all MHS drives shut down in case of a potentially dangerous ESD situation.

The safety-critical systems are designed not to have a single point of failure, which could lead to unsafe situations.



The MHS is fully compliant with DNV-GL WIU-1 and Well-1 classification for vessel-mounted systems associated with well intervention (DNV-GL OS-E101 Drilling Plant). The system is also designed in compliance with DNV-GL 2.22 Lifting Appliances.

Main operations

- well intervention with subsea intervention lubricator
- installation and removal of subsea Christmas trees.

Key features

- fully integrated and redundant control system
- integrated hydraulic and nitrogen system
- high level of system integration
- DNV-GL classed and certified to WELL-1 and WIU-1
- DNV-GL OS-E101, Drilling ship & 2.22 Lifting appliance
- suitable for dedicated purpose-built vessel or vessel of opportunity.

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Key features

General

Water depth maximum	500m
Environment	North Sea region, UKCS, West of Shetland, West Africa
Operational Hs	5m

Main hoist system

<i>Drawworks winch with in-line active/passive heave compensator (AHC/PHC)</i>	
SWL	150mt
Dynamic capacity	195mt
Lowering/hoisting speed	10m/min
Wire speed AHC	90m/min
Wire speed PHC	120m/min
AHC Compensator wire stroke	10m
Lifting height maximum	30.7m

Cursor system

<i>Upper and lower cursor with dedicated winch (CT mode)</i>	
SWL	10.4mt

Guide-line system (4x)

<i>Winch (AHC, CT), tensioner (PHC) with integrated wire adjustment arms</i>	
SWL	4.8mt
Wire speed AHC, winch	90m/min
Wire speed PHC, tensioner	120m/min
Tensioner wire stroke	12m

Pod-line system (2x)

<i>Winch (AHC, CT), tensioner (PHC) with integrated wire adjustment arms</i>	
SWL	9.5mt
Wire speed AHC, winch	90m/min
Wire speed PHC, tensioner	120m/min
Tensioner wire stroke	12m

Skidding system

<i>Pallet with SIL support structure and dedicated drive system</i>	
SIL maximum height	26.3m
SIL maximum footprint	4x 4m
Pallet capacity	120mt
Drive system	push-pull units
Skidding speed	0,75m/min

Moon pool hatches

<i>2x rotating hatch, 2x pivoting hatch</i>	
Capacity, skidding system load	170mt
Capacity, XT load	60mt
Capacity, dropped object @ 1m	135mt

Umbilical compensation system

<i>Passive motion compensation based on deadweight</i>	
SWL	1.5mt
Effective line stroke	12m

Hydraulic system

<i>Hydraulic power unit (pump skid, tank skid, filter skid), manifolds, tie-in panel for Client consumers (deck tugger winches, frac pumps)</i>	
Pump sets	4 pcs
Total capacity	2,000kW

Nitrogen system

<i>PHC nitrogen skid, nitrogen storage skid, nitrogen generator and air compressor</i>	
Total gas capacity	20,000l

Control system

Control cabin integrated on tower, electrical power distribution system, SCADA control system, CCTV system, exterior lighting

- operator positions with Cyberchair (2x)
- local control panels (2x)
- fully redundant Siemens PLCs with distributed network
- wire rope monitoring system for hoisting systems
- integrated MHS and client CCTV.



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