

SINGLE POINT MOORING

Your partner

Design, Engineering, Procurement and Construction Services

OMP Services BV
Westerschans 1
2352 DK Leiderdorp
The Netherlands
Phone: +31 715892406
E-mail: info@omp-management.com



The Single Point Mooring (SPM) system consists primarily of:

- A Piled PLEM including a sliding piping section with Hydraulic Operated Ball Valves.
- A 6 leg equally-spaced anchoring system.
- An SPM Buoy (turntable buoy) consisting of:
 - o A buoy body with centre well
 - o A turntable located on the top of the buoy body
 - o Rigid piping incorporating a central pipe swivel, butterfly valves and flexible joints.
- Two submarine and floating hose strings;
- Dual mooring hawser arrangement, including ancillaries.
- An hydraulic accumulator system to operate the PLEM valves;
- An umbilical between the Buoy and the PLEM;
- Hoisting, maintenance, life-saving and navigation equipment.
- Telemetry equipment

The PLEM connects the pipeline with the two submarine hose. The submarine hose strings provide the flow path between the PLEM, the piping system on the SPM Buoy and the two floating hose strings. The buoy body design includes a skirt holding the chain stoppers. Each of the six compartments are provided with a manhole, access ladder and sounding pipe. The turntable includes heavy pad eyes to lift the entire SPM Buoy including turntable and has mooring line connection points for small craft.

The buoy body and turntable are connected by means of a heavy duty slewing bearing. All mooring forces will be transferred thru this 3 race roller bearing (main bearing) and is designed to withstand the maximum mooring force.

The turntable is provided with a cover to protect the main bearing against sea spray and rain. The turntable includes a boat landing platform, piping platform and mooring bridle platform. The boat landing can accommodate the mooring of small vessels .

The mooring platform accommodates the mooring bridle and load pin. The dual hawser system is connected to the mooring bridle to transfer the mooring load from the tanker to the turntable.

The load pin is designed to generate a visual alarm and audible alarm and enables to provide read out of the mooring load at the shore station via telemetry.

The Solar System is combined with the Navigational Aids and provides 24 V electric power to operate the HPU solenoid valves. The HPU is provided with a Junction Box to enable the operator to install a remote operation unit at a later stage.

The SPM Buoy is provided with navigation aids such as: marine lantern, fog detector, foghorn and radar reflector. The navigation aids, telemetry system and HPU are powered using a LV electrical system consisting of:

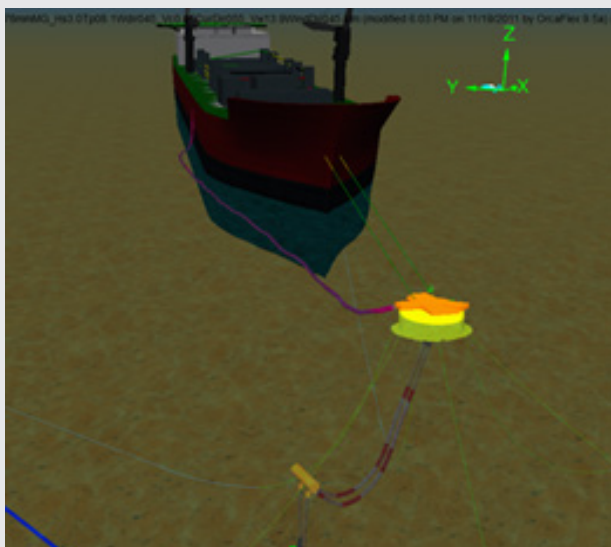
- solar panels,
- battery unit,
- regulation unit,
- load cell process unit and
- power distribution unit.



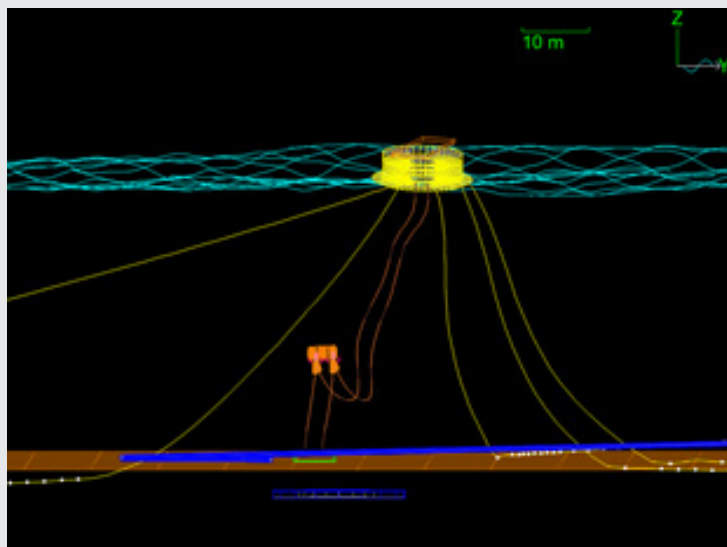
SPM Buoy



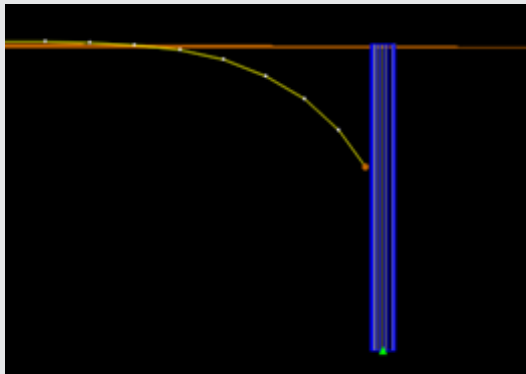
Mooring layout



Mooring Analysis

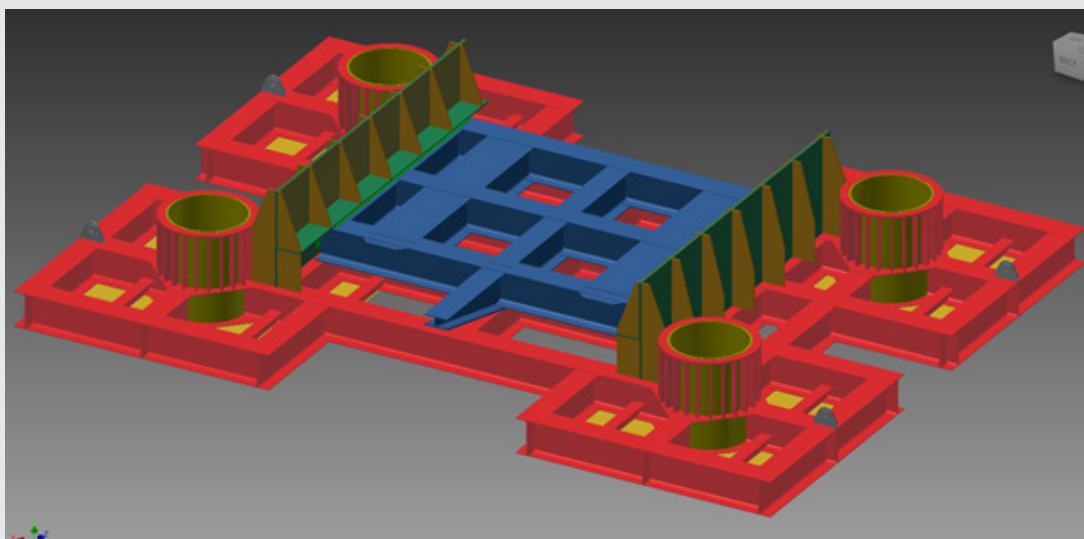


Mooring line and submarine hose string analysis

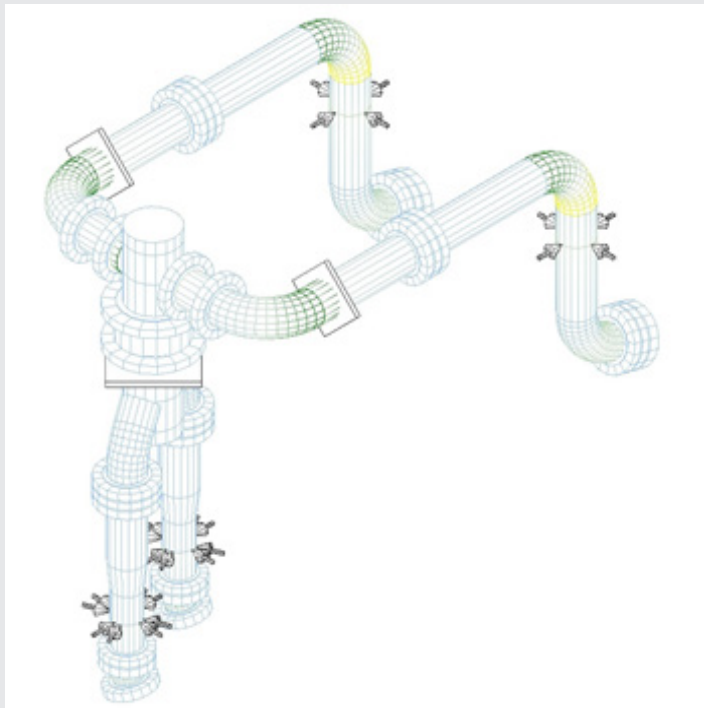


Mooring pile (point) design

PLEM Design



Piping design

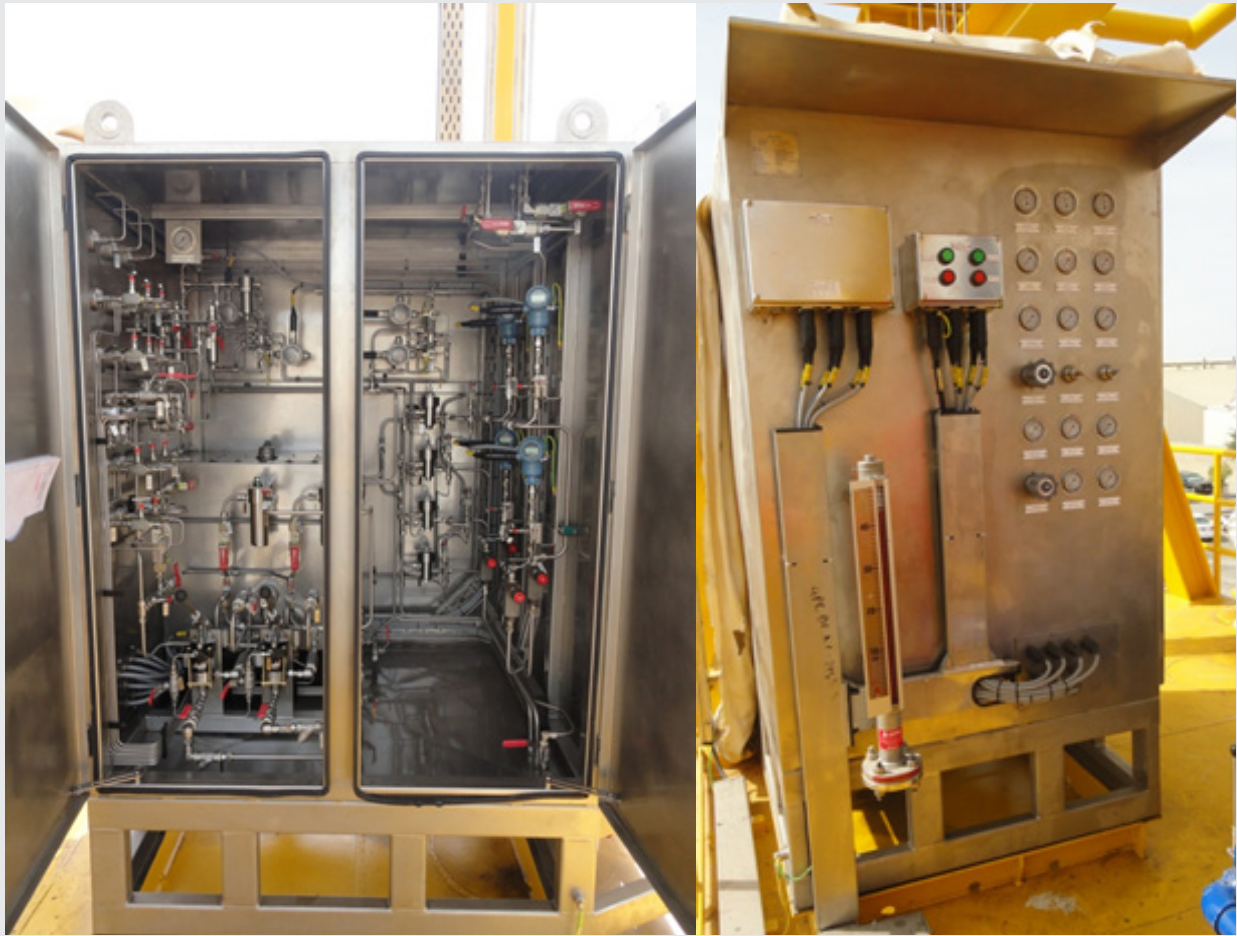


Product Swivel





Calm Buoy free floating in the water



Hydraulic Power Unit



Navigation aids system



Chain stopper



Mooring bridle



Floating and Submarine hoses

SPM SPECIFICATION

Water depth

OMP SPM's can be designed up to a water depth of 100 m.

Export flow rate

The flow rate for the loading system will be up to 12,500 m³/hr. The product can be vary from heavy crude oil to condensate. OMP SPM's can be designed for Orimulsion.

Design Environmental Conditions

The SPM system is designed to the following conditions:

Operational condition (with Tanker moored)

- Significant wave height : 3.5 m
- Current : 1 m/s
- Wind speed (1min mean) : 20 m/s
- Wind speed (1hr mean) : 15 m/s

Survival condition (Buoy only).

- Maximum wave height : 12.2 m
- Current : 1.2 m/s
- Wind speed (1min mean) : 30 m/s
- Wind speed (1hr mean) : 24 m/s

Nominal Tanker Data

The OMP SPM system can be designed for mooring of tankers of 350,000 DWT tankers. Larger tankers can be arranged at request.

TECHNICAL DATA

Buoy size	:	12 m Outside Hull Diameter
	:	4 m Inside Moonpool Diameter
Skirt size	:	15.7 m
Chain stoppers	:	6 units suitable for 70 to 95 mm chain.
Main Slew Bearing	:	Triple row roller bearing
Piping	:	2 x 24 inch Product Lines
Flexible Joints	:	Stainless Steel
Pipe swivel	:	1 x 36 inch Product Swivel with Electrical/Hydraulic swivel on top
Mooring connection	:	Mooring bridle suitable for twin OCIMF hawsers.
Navigation light	:	LED, 10 Nautical miles with daylight sensor
Foghorn	:	Two nautical miles, with fog detection
Radar Reflector	:	Passive
Load pin	:	Up to 400 ton
Hydr. Power Unit	:	Operation of 3 PLEM valves. Electrical or Air driven.
Safety	:	2 Fire Extinguishers and 2 Life Buoys
Chain tensioning	:	25 tons
Air winch	:	5 tons.