

MOSES SSIP TLP

The MOSES Self Stable Integrated Platform (SSIP) is a Tension Leg Platform (TLP) that has inherent stability that allows quayside integration and commissioning of the topsides to the hull structure, wet towing of the integrated platform to the installation site, and eliminates the need for expensive temporary buoyancy or crane assisted installation assistance. The hull configuration is comprised of a central base structure, four Tendon Support Structures (TSS) and four vertical columns. The base and TSS structures are located deep below the surface and provide a significant portion of the platform's buoyancy. Each TSS is a rectangular pontoon structure with varying depth that is oriented radially out of the base structure. The columns are located further outboard, smaller than conventional TLP columns, and are rectangular in shape. A total of eight tendons are supported at the end of the TSS (two at each end) via top connectors on a porch arrangement. The tendons are connected at the sea bottom on piles via bottom connectors. The MOSES SSIP TLP can support a variety of drilling or workover rigs and a large number of Top Tension Risers (TTR's) and flowline risers. The MOSES SSIP TLP can be used with wet and/or dry trees in harsh and mild environments.

Technology Description

Overview

The MOSES SSIP TLP is a Modec-proprietary 5th generation TLP which offers superior in-situ safety and performance, design flexibility, fabrication simplicity, and ease and risk of installation when compared with other TLP designs. The Oveng and Okume TLPs were installed in Equatorial Guinea for Amerada Hess Equatorial Guinea in 2006 and were the first application of the MOSES SSIP TLP.

The MOSES SSIP TLP is an integrated platform that is stable and self-installable with a quayside-integrated deck and without the use of any temporary stability modules or an expensive heavy lift crane vessel. The novel hull form provides the superior efficiency, constructability, and hydrodynamic performance typical of a new generation TLP while having the stability necessary for quayside integration and commissioning, and provides a safe open-wellbay arrangement for drilling and production.

Features of the SSIP include:

- One-, two-, or three-level deck that supports drilling, production, and utility systems and top-tensioned drilling and production risers (TTRs). The deck is integrated and pre-commissioned with the hull at quayside prior to offshore transport. The quayside integration significantly reduces the risk and cost of offshore installation;
- An efficient and easily constructed hull consisting of:
 - Four small radial columns which provide improved waterplane stability and deck post support for optimum deck structural support;
 - A submerged unitized pontoon base structure;
 - Four outrigger tendon support structures (TSSs) to increase the tendon support footprint thereby reducing the tendon loads; and
 - Riser support structures on the hull with TTR riser keel guides to support the external wellbay.
- Open end wellbay(s), enhancing wellbay safety and arrangement flexibility;
- Top-tensioned drilling and production risers that can be directly supported on the deck using fixed tensioners in mild environment locations;
- Tendon mooring system connected to the hull at the tendon porch located at the outboard end of each TSS provides improved mooring loads and station keeping.

Benefits

1. Widens the Application of TLPs

It significantly increases the water depths in which it can efficiently operate in both mild and hostile environments, as compared to existing TLPs. This is because the TLP is lighter and the mooring footprint is more effective.

2. Reduced Installation Costs and Risks

The MOSES SSIP TLP enables the deck to be integrated at quayside and pre-commissioned prior to transport. The platform is stable on its own during all pre-service phases including ballasting down and installation, without use of any temporary stability modules or semisubmersible crane vessel, significantly reducing the complexity, weather dependence and risk exposure and reduced cost of the installation and reduced cost of offshore hookup and commissioning, at the same time providing additional flexibility in terms of the candidate vessels for the installation.

3. Well Bay Safety and Flexibility

The MOSES SSIP TLP design uses open end wellbay(s) to support top-tensioned risers, and has a number of important advantages:

- Maximum separation between the wells and quarters maximizes personnel safety of the deck layout.
- Maximum platform safety for a blowout or fire in the wellbay enabling expulsion of gases and flames and open side access for firefighting.
- Easy access to all dry trees and facilitates layout of jumpers, manifolds and equipment, unlike designs with a central moonpool.
- Unobstructed deck on the wellbay side(s) for safer and easy rig-up of the drilling rig system.
- Flexibility to accommodate more TTR slots without major rework of the hull configuration, unlike a central moonpool which may result in a step change in design and cost.

4. Drilling Flexibility

The MOSES SSIP TLP design can be used with a wide range of existing rigs. The end wellbay and the skid beam layout adapts to suit a wide range of drilling rigs without structural or payload penalties or use of a pony skid to stay within the skidding limitations of existing drilling or workover/completion rigs. Drilling can be performed with either a self-contained platform rig or a tender-assisted platform rig.

5. Superior Motions and Well-Systems Friendly

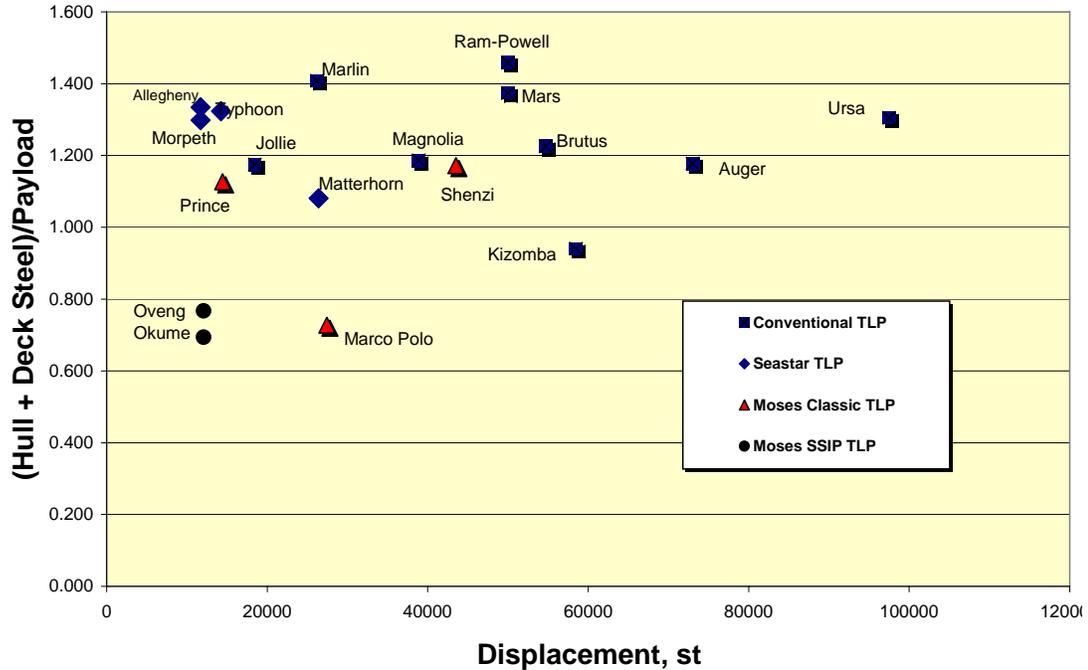
The MOSES SSIP TLP hull design has superior motions compared with other deepwater platforms supporting dry trees. The design deck lateral accelerations are significantly less than those of spars and other TLP designs, improving the operability and performance of facilities, such as the separation of production fluids and water treating.

The low motions of the MOSES SSIP TLP combined with use of riser keel guides enables the top-tensioned risers to be directly tied back and be supported on the deck without use of tensioners for mild environment applications.

6. Efficient Hull

The MOSES SSIP has the best metric payload capacity per ton of structural steel of all the deepwater platforms supporting dry trees that were shoreside integrated with the topside (see metrics below). Note the MOSES Classic TLPs and Seastar TLPs were integrated offshore.

**TLP Steel Weight-to-Payload Ratio Versus Displacement
(Payload excludes Deck Steel)**



7. Efficient Deck

The MOSES SSIP TLP deck is optimized free from hull spacing, size or water depth constraints. Therefore, the MOSES deck structure is also very efficient due to improved support from the radial columns that reduce the deck spans and cantilevers, thus reducing the size of the deck girders.

8. Improved Constructability

The hull design consisting of stiffened flat plates and simple connections results in improved constructability relative to other TLPs. This results in more economical hull fabrication and in faster construction schedules.