Swinging the balance

SDS is a low-cost alternative lift system that allows greater flexibility while challenging existing methods

The subsea industry is increasingly developing more complex fields in deeper water. Typically these involve deploying large structures in hostile environments that challenge the capabilities of most existing installation vessels.

The limited availability of suitable vessels and the restricted operating windows in harsh environments can place significant constraints on the project schedule.

The Subsea Deployment System (SDS) is a low-cost alternative to a conventional lifted installation that meets or exceeds the weight and depth capacities of existing vessels. The system uses a fully submersible deployment vehicle (SDV) to support the subsea structure during transportation, positioning and installation.

The complete assembly is transported to site using a submerged tow which largely eliminates the effects of the surface environment. It also avoids the often critical phases of offshore over boarding and lowering through the splash zone. Final positioning and set down are achieved by means of chains lowered into the SDV which behave as soft springs and minimise dynamic loading.

Reducing costs

The SDS enables even the smallest crane vessel to install large structures and in many cases it would be possible to perform the entire offshore phase with a single anchor-handling tug equipped with a work class remotely operated vehicle (ROV).

This offers significant potential cost savings and greater schedule flexibility compared to a heavy lift vessel (HLV). The reduced sensitivity of the installation to the surface conditions increases the operating window to allow almost year-round operations in even the most hostile environments.

The low dynamic loading and ability to adjust the net pressure between the structure and the sea-bed gradually also make it ideally suited for retrieval and decommissioning of structures. Furthermore, when retrieving an existing structure it is not recovered to surface offshore, which avoids the transition through the splash zone with the associated loss of buoyancy.

Unlike a conventional lift where it is difficult to suspend operations once the lift has begun, there is no ‘point of no return’ with the SDS and the installation can be suspended at any time during without risk to personnel or assets.

Changing the game

Subsea installation has historically been based on the principle that structures need to be lifted into place and the bigger the structure the bigger the crane required. However, the SDS creates a near-neutrally buoyant system by coupling the structure to a buoyant deployment frame, and then pushes the assembly down to the sea-bed by adding a small amount of weight in the form of chain.

Once the assembly is on the sea-bed further ballast is added incrementally to balance the buoyancy of the deployment frame before it is disconnected from the structure. This allows a small crane vessel or anchor-handling tug to install or recover any structure independent of its size or weight.

The technology behind the individual aspects of the SDS is well proven and based on simple engineering principles but the combination provides a uniquely simple solution to an increasing problem.

Why buy?

SDS is a safe, simple, low-cost alternative to a conventional lifted installation. It offers the ability to install structures of up to several thousand tonnes in water depths of up to 3,000 metres in the harshest environments using a small crane vessel or anchor-handling tug.

The use of smaller installation vessels and the increased weather window offers greater schedule flexibility and the potential for early field production.

SDS is still at the concept stage and the firm is seeking a suitable partner to assist in bringing the system to market.

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