

# Multitasking supplements intervention

*Light, multitasking vessels lower risks, costs for activities in existing offshore wells.*

### AUTHOR

**Steve Nairn,**

*Helix Energy Solutions Group Inc.*

Operating companies challenge their offshore managers to squeeze more production and generate more profits. Field managers, in turn, often pass the challenge on to service companies that can offer the most efficient solutions.

That same challenge created a surge in offshore production support options that make more efficient use of existing technology and experience or generate new, more cost-effective methodologies.

Operators may achieve utmost flexibility by using deployment-by-vessel, or light well intervention (LWI), to address a wider variety of needs: the use of a light vessel with flexible capabilities in place of a more expensive drilling platform. The key word is “multitasking.”

Economic forces interact and create innovative approaches to offshore services, especially in the North Sea. One boardroom-level economic concern is about the integrity and productivity of the aging assets in many regions. These assets have appeared to be increasingly uneconomic for companies to work with traditional approaches.

The actual matter of fact is this: Operators with existing fields don't need the services of expensive, dedicated units. Instead, multipurpose vessels can economically provide wireline-based well intervention or inspection, repair and maintenance (IRM) diving services to maintain production.

In the past, intervention, for example,



*The MSV Well Enhancer performs many subsea intervention jobs at a cost lower than traditional vessels. (Graphic courtesy of Helix Energy Solutions Group)*

might have been accomplished by dedicated drilling platforms with workover equipment. But because of today's economic pressures, offshore drilling rigs are in short supply; there are often lengthy waiting periods for availability.

### Flexible technologies

The deployment-vessel concept — the planned convergence of established technologies — can now be considered a proven line of attack to relieve the pressure of economic operations. It is a flexible approach that can answer intervention needs (maintaining production of increasingly expensive oil and gas) or solve even more immediate problems (decommissioning, logging, repair, tree operations, diving, etc.).

The decommissioning of subsea wells, for example, has been just one catalyst for the development of rigless support, deployed on highly effective

vessels rather than high-cost platforms. Helix Energy Solutions Group is *MSV Q4000* has been active as a well intervention vessel in the Gulf of Mexico for several years, capable of operating in water depths down to 10,000 ft (3,050 m) and live well intervention experience on the *Independence Hub* in 6,500 ft (1,982 m) of water. *MSV Seawell*, a mono-hull support vessel, has been providing simultaneous diving, remotely operated vessel (ROV) and well intervention services in the United Kingdom since 1987.

It has been proven that many projects (especially in the North Sea) do not require the services of a heavy-duty vessel. Both economics and job requirements have shown that there is a need for a lighter-duty vessel that emphasizes multitasking. There is a broader range of uses for the vessel, which make it a more valuable service option since past history indicates just

17% of deployment time is spent on intervention; decommissioning, logging, mechanical repair and tree operations constitute 28% of the time (in days); and IRM diving support accounts for 32%, on average.

It is this multifaceted operating regime where light deployment comes into play: a single vessel which integrates extended well testing, well plugging, saturation diving capability, production enhancement via wireline and — now — coiled tubing. Such a purpose-built hull, with increased efficiencies built in, can perform a variety of tasks in the North Sea, including enhancement of producing assets.

### New hull design

*MSV Well Enhancer* is the result: a new hull based on a proven design, a dynamically positioned monohull that is building to Det Norske Veritas classification standards in the Netherlands — and specifically designed for cost-effective well support, intervention and construction operations in the North Sea. (A heave compensation system is crucial to the new vessel's subsea support capability. This is because it effectively eliminates any vessel movement when connecting the subsea intervention lubricator — SIL — to subsea trees.)

Vessel capabilities match operators' requirements for effective offshore support, including well stimulations, production logging, zonal isolation, suspended well abandonment, well-head removal and tree recovery and inspection, repair, and maintenance diving.

Multitasking LWI vessel deployment offers operators significant opportunities in terms of time-savings and risk reduction as well as flexibility of methodologies — especially when a number of innovations are encompassed within the vessel's capability envelope from the outset.

### Minimizing risks

The design team focused intensive efforts on minimizing or eliminating failure potential. It has removed complexity from the plans to reduce risks. The process has been called “back-to-the-future” engineering because the company has learned extensively from its existing vessels and their long-term deployments.

All equipment, for example, is designed in advance to work under the same sea-state conditions, a 14.8-ft (4.5-m) wave height. There's no single point-of-failure on board, which enhances reliability of operation.

Thinking “beyond the horizon of immediate need” maximizes efficiency and saves time. For example, on the new light-duty vessel there is a 160-metric-ton Huisman multipurpose tower that offers access to the moon pool on three sides, which means greater efficiencies in deck layout.

The intervention lubricator control system, the active heave compensated main winch and all well kill pumps are grouped below deck to keep them out of the way. Major functions are monitored and controlled from a central cabin overlooking the work deck.

The vessel is designed with ample deck space for a range of well test packages to flow the well back to the surface for clean-up operations. An offloading hose package can also be included for hydrocarbon transfer to suitable dynamic-positioning (DP) tankers.

The light vessel can undertake a full range of slick line and electric line services. It also has the ability to perform safe, low-risk coiled tubing operations from its monohull platform, with its proven efficiencies for wellbore cleanout, casing exits and multilaterals, and fishing operations.

The SIL is the forerunner of technology used in riserless light well intervention. The 5½-in. system, now in its third generation, set an industry standard for efficient interfacing with vertical and

smallbore concentric subsea trees.

For the new vessel, a 7½-in. SIL takes this proven technology one step further by creating a single-trip system that gives access to large-bore subsea assets in deeper water. The unit can also deploy its SIL in a single piece, which can save up to 10 hours per run.

A 10,000-psi choke manifold controls the return to surface of hydrocarbons that accumulate in the SIL. Returned hydrocarbons pass from the choke manifold into an atmospheric storage and separation tank that can be deployed on deck for well operations.

When additional volumes of hydrocarbons have to pass through the vessel, the built-in flexibility allows changes to increase the amount of storage as well as the need for gas flaring. With this equipment, the new vessel can be fully certified as an “offshore installation” in line with current UK governmental guidelines.

Just as important, the new vessel includes an 18-man saturation diving complex for operation in 984 ft (300 m) of water, a 100-metric-ton heave-compensated deck crane, two ROV launch-and-recovery systems, a riser capability to facilitate the deployment of coil or long wireline tool strings, and a cementing and well kill pump system.

Because the new vessel is a multi-purpose platform (with a multiskilled crew), it also offers flexibility: an efficiency-improving, cost-saving integrated package. This kind of deployment could previously be done only from a platform. Overall, North Sea operators gain better usage of the vessel per day on hire.

The light rigless flexi-function vessel enables operators not only to save on the cost of a drilling rig but get more timely well support for a number of demands — not just production enhancement. This could save a well or two: the real benefits of multitasking LWI vessel deployment. **KAP**