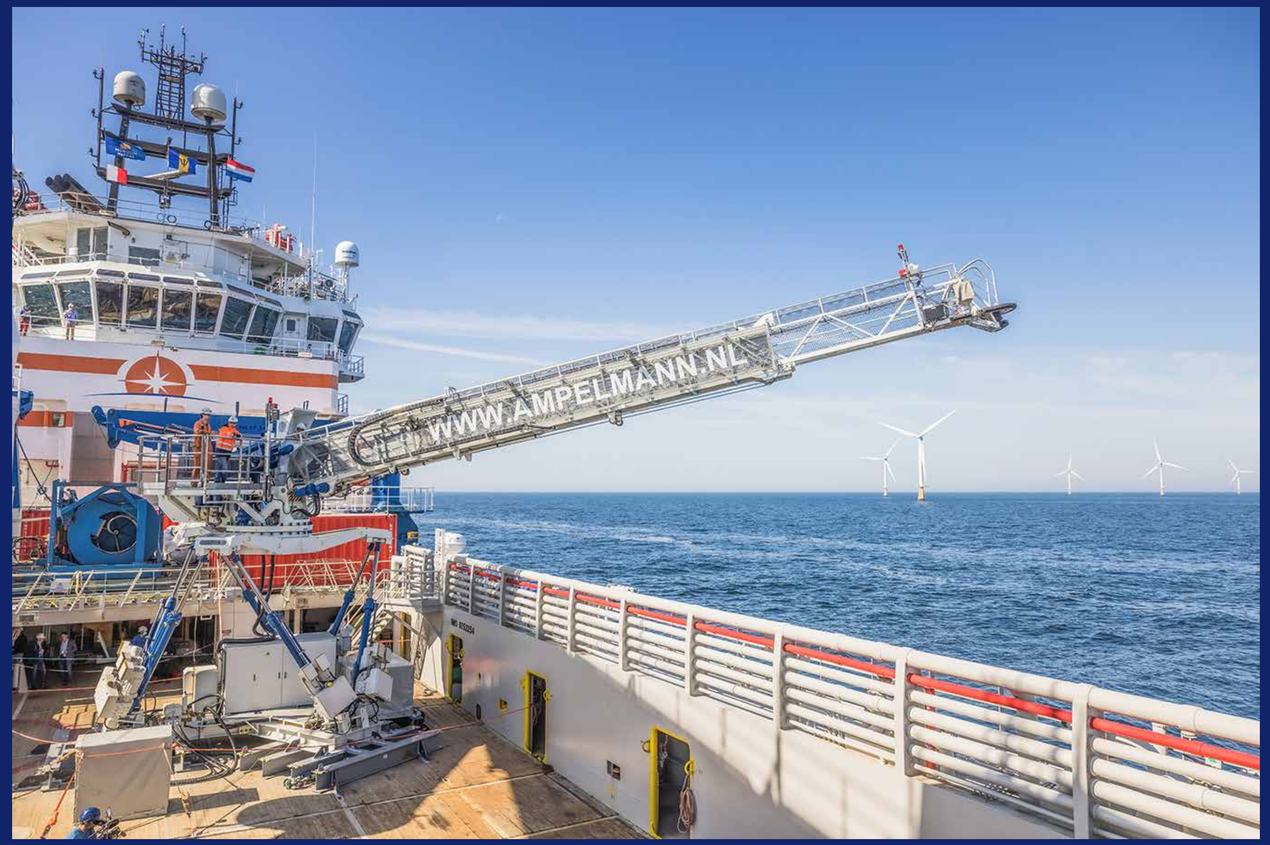
AMPELMANN

Mind the gap:

Safe W2W solutions for Mini SOV’s



As the offshore wind sector matures the need for tailored offshore access is becoming increasingly clear. A widening operational gap between traditional crew transfer vessels (CTV's), suited for short distances and calmer seas, and full-sized service operation vessels (SOV's) which are designed for deeper waters and harsher conditions is emerging. Revealing a growing trend toward specialised access solutions that solve distinct operational challenges, new, smaller, cost-effective access solutions are currently in development that bridge the gap.

So-called 'Mini SOV's' strike the perfect balance between operational flexibility and range, consume less fuel, require fewer materials to construct and have shorter production timelines. Ideal for the relatively mild sea conditions such as those in the Baltic Sea, or, more generally, intermediate distances closer to shore, these versatile and purposedly designed W2W solutions are built with the highest standards of cost-efficiency in mind.

Designed to house smaller crews for more specific regional conditions, these vessels are not simply scaled-down versions of traditional SOV's but purpose-built platforms that call for tailored logistics and access strategies. But if Mini SOV's are to bridge the gap between CTV's and full-sized SOV's, they demand a thorough investigation into how active motion compensated gangways – the heart of modern W2W solutions – are utilised and implemented to fit their specific operational needs.

Adapting to scale: rightsizing offshore access

Mini SOV's are designed to operate in distinct marine and market conditions. As the demand for clean and sustainable energy continues to grow globally, the offshore wind frontier is not only expanding further offshore into deeper seas, but also gradually moving into shallower and milder waters. Outside of Europe's "Green Power Plant" in the North Sea, an ever-growing number of wind turbines need to be built and maintained in these emerging and maturing markets.

Especially the Baltic Sea, where significant wave heights during most of the year are typically under 2m Hs, major short- and long-term growth is expected. The 2024 Vilnius Declaration committed to a collective target of 19.6GW to be installed by bordering European states by the end of the decade. With the first large scale project, off the coast of Poland (Baltic Power), expected to be fully commissioned by 2026 – and similar projects being planned in the Mediterranean – there is a well-defined and growing demand for agile, capable mid-range logistics platforms.

Even within mature offshore wind basins such those in the North Sea, there are a substantial number of wind turbines in relatively benign marine conditions. Though CTV's have proven effective for close-to-shore operations, at the intermediate distance, these vessels lack the accommodation facilities for longer stays at sea, reducing tool-time due to time lost in transit. Weather conditions further constrain their performance, leading to unsafe, and at best, unreliable working conditions.

While the C/SOV concept emerged to meet demands of deep-water wind farms, they require significant capital and operational investments. This is where the Mini SOV concept comes in. Yet, despite the relatively gentle seas in which these vessels will operate, their compact design and more limited station-keeping capabilities typical of larger C/SOV's mean they are more exposed to the effects of incoming waves—particularly causing rolling motions.

In other words, while sea conditions are more forgiving, the vessels motions are not. Larger integrated tower systems – like the electric W-type – are not the preferred solution because of their weight, footprint and higher telescoping speeds in these specific conditions. Instead, Mini SOV's require lightweight, high-performance gangways capable of maintaining a safe and stable connection to turbines under more variable vessel motions. Innovative gangway designs will be critical in order facilitate the growing need to scale up cost-effectively without compromising on safety and reliability.

Ampelmann’s Hexapod: a trusted solution

Concept study of a Mini SOV with the Ampelmann Electric A

With continuous innovation always in sight, Ampelmann has been keenly following the developments in this market. Collaboration was initiated with vessel designers and shipbuilders, including Sirius Design, Ulstein and Nauplius, which was followed by a series of studies aimed at identifying the most effective way to integrate a gangway into the overall vessel concept.

Ampelmann’s Electric A is the ideal market solution to overcome these various challenges. Like its hydraulic counterpart, the system is capable of transferring personnel and cargo in sea states up to 3m Hs, ideal for the conditions such as those in the Baltic.

With its well-known hexapod that allows the system to compensate for motions in six degrees of freedom (6DOF), it offers offer a superior advantage over traditional 3DOF systems because it compensates for motions in all directions. The gangway remains stable during offshore operations. Even in more demanding conditions such as on Ship to Ship (S2S) operations, or, for example, Hywind Tampen’s floating wind turbines, the telescoping speeds of a hexapod based gangway remain low, never exceeding those of an escalator.

In this way, the hexapod not only ensures comfortable standards of safety, but this also translates into meaningful gains in overall workability. It was calculated that an additional 15% in workability can be achieved through the proper utilisation and placement of the (Electric) A-type on this class of vessel. By extending weather windows, even in the winter months, and improving uptime, this represents a significant cost-saving while guaranteeing the safety of offshore personnel and cargo throughout the year.

One of the key advantages of this system is that it can access the transition pieces of turbines up to 23 meters without the need of a heavier tower. A proven solution that has met with significant success on Platform Supply Vessel (PSV) conversions, this is well within the range of a significant proportion of the world’s offshore turbines.

Flexible positioning of the Electric A and composite slideway combination on a concept Mini SOV

Uniquely in the market, the Electric A not only compensates for motions in six degrees of freedom it does so while consuming very little energy. Through electric regeneration, the energy the system uses to compensate for all the motions is fed back into the system, meaning it consumes between 80 and 90% less energy than its fully hydraulic counterpart.

As this also means it does not require an HPU, the system has a smaller total footprint and is relatively light, which contributes to the station keeping capabilities of the vessel. In spite of the compact deck space requirements on Mini SOV's this also allows for flexible positioning on the vessel while allowing for enough space to simultaneously install the composite slideway to enable continuous flow of personnel.

Cost-effective access, engineered together

Just beyond the effective operational horizon of ordinary CTV's and right before SOV's can be utilised optimally, a growing number of wind farms in relatively benign sea states are in need of versatile, cost-effective access solutions. Mini-SOV's represent an important new turn in this market, but require smaller, lighter, high-performance gangways to guarantee the same degree of workability and safety as their larger cousins.

Necessitating a close cooperation between all stakeholders across the renewable energy sector, Ampelmann is anticipating the growth of this market and is collaborating with several major ship designers to integrate its proven hexapod technology into this new class of vessel. Paving the way for optimised and cost-effective offshore logistics, the full motion compensation afforded by the Electric A is particularly effective for work in these specific marine and market conditions.

With considerable reach and no HPU, this energy efficient access gangway offers a clear advantage in terms of size, safety and environmental impact. By extending weather windows, improving uptime and ensuring smooth and continuous transfers for personnel and cargo, its high workability makes it an ideal, sustainable and cost-effective solution to safely bridge the operational gap.