Redefining the way we work offshore

Media Q&A

What are the key benefits of Uncrewed Surface Vessels?

SEA-KIT aims to drive down the cost of geo-data collection and reduce the offshore sector's carbon emissions. The company's 12m X-class USV is simple and cheap to mobilise, fitting inside a standard 40 foot shipping container. On task USVs use less fuel and are remotely controlled, meaning that operating and running costs are also lower than larger, crewed vessels. On standby, costs are minimal and the switch to downtime is far more efficient.

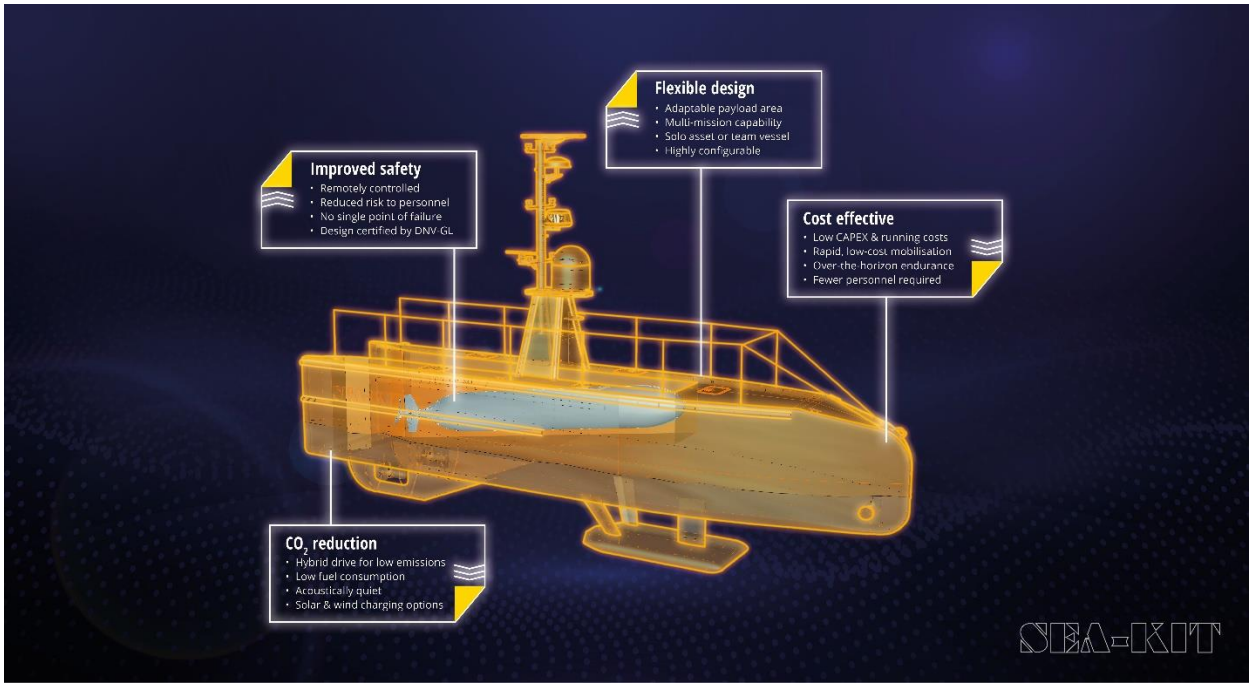
People and offshore teams are moved back to a safer environment with remote-control capability. This reduced need to have personnel offshore and the resulting reduction of HSE exposure is a major benefit for the offshore industry as a whole.

SEA-KIT's remotely-controlled Uncrewed Surface Vessels (USVs) are designed with an adaptable payload area for multiple mission configurations. USVs can work standalone or as part of a fleet to complete a wide range of tasks faster, cheaper and with less risk to personnel and significantly reduced carbon emissions than traditional, crewed vessels.

The key benefits of SEA-KIT's commercially-proven USV design can be summarised as:

- Design flexibility
- Improved safety
- Cost-effectiveness
- Reduced environmental impact

Please see the infographic below for more detail.



What are the applications for USV technology?

SEA-KIT's USV technology has applications in multiple sectors and is already proven on commercial offshore projects. SEA-KIT's current focus is on commercial, defence and security and luxury superyacht applications.

Commercial

SEA-KIT Uncrewed Surface Vessels (USVs) are designed to provide a low-cost and environmentally low-impact solution to the numerous challenges posed by commercial offshore projects. These adaptable, uncrewed and remotely-controlled vessels enable over-the-horizon deployment of systems and sensors for many commercial use cases, including maritime logistics, environmental management, marine inspection and efficient survey of the ocean floors. Through extended mission capability and reduced downtime, the deployment of SEA-KIT USVs represents significant cost savings as well as reduced carbon emissions for companies operating in the commercial offshore sector.

Defence & Security

SEA-KIT Uncrewed Surface Vessels (USVs) provide a safer, low-cost and environmentally low-impact solution to the military, defence and security sectors. These adaptable, uncrewed and remotely-controlled vessels enable over-the-horizon deployment of systems and sensors for numerous mission types, including naval operations and the security and monitoring of coastal offshore assets. By moving military and security personnel back to a safer

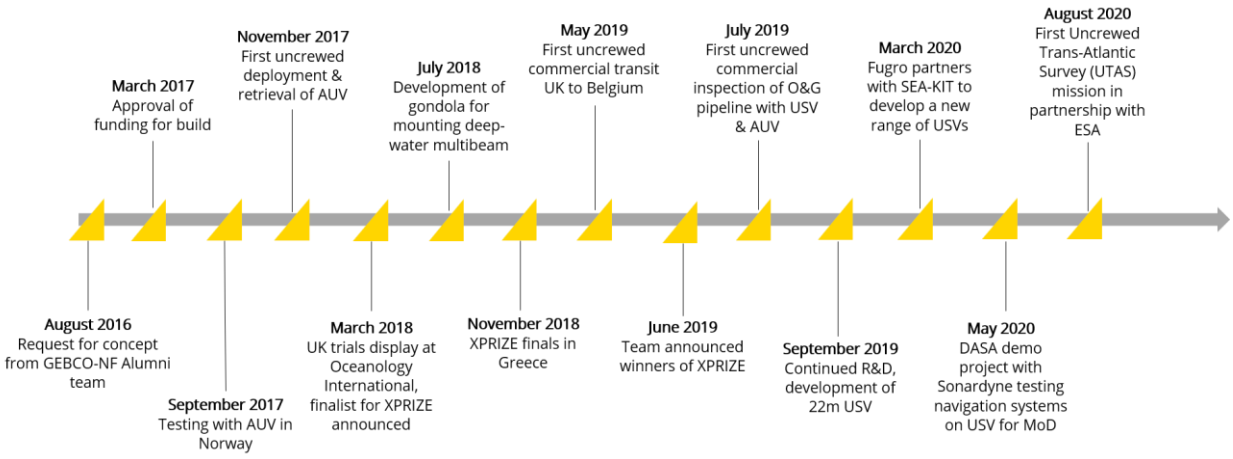
environment, SEA-KIT USVs significantly reduce operational risk. In addition, simple and low-cost mobilisation, extended mission capability and reduced downtime costs (compared to crewed vessels) make SEA-KIT USVs a fit-for-purpose solution to many military and security challenges.

Luxury

SEA-KIT's award-winning and commercially proven Uncrewed Surface Vessel (USV) design is set to significantly change superyacht operations, embracing new and innovative technologies to provide an unparalleled leisure experience for yacht owners, their guests and crews while substantially decreasing the environmental impact of superyachts. SEA-KIT's 36m USV can deliver all the benefits of a support vessel with significant advantages compared to a traditional crewed vessel, including reduced environmental footprint, lower capital and operating cost and a flexible design enabling owner-specific configuration.

What has SEA-KIT achieved to date?

The timeline below outlines SEA-KIT's key business and technological achievements to date.



What is the future of USV technology and will USVs replace crewed vessels?

There is no doubt that USVs are the future of marine exploration, unlocking many key benefits for industry players. The USV market is growing rapidly with the technology now being more regularly adopted for an ever-increasing variety of use cases.

USVs offer an opportunity to completely re-think how vessels are designed and built, allowing them to become more cost-effective and fuel-efficient. SEA-KIT's 12m X-class vessel has already conducted offshore operations that would have typically been performed by crewed vessels (that are several times the cost) whilst comparatively using only 5% of fuel.

The benefits of future adoption of USV technology for the offshore sector as a whole are outlined below:

- *Safety*
  The biggest positive is increased safety. The reduction of HSE exposure through not having personnel offshore is a substantial benefit. Remote Operation Centre-controlled USVs using remotely operated vehicles (ROVs) and cloud-based data acquisition, processing, and delivery solutions are the key enablers for this.
- *Sustainability*
  A second key benefit is sustainability. The integration of smaller and hybrid uncrewed vessels will lead to a significant reduction in fuel consumption – 95% less than traditional vessels. This consequently reduces the CO_2 footprint of expeditions. As the shift from traditional vessels to USVs begins to grow over the next few years, this impact will become even more significant.
- *Optimisation*
  The third key benefit is the ability to fully optimise teams and ways of working. With the deployment of USV technologies, people can be involved in the more complex analytical tasks, rather than being required for the elements of delivery. This leads into another obvious advantage: real-time insights and more efficient decision making, faster data processing and data delivery. With more complex data to analyse, better insights and advice can be given to clients. Through digitisation and cloud-based solutions, near-real-time data can be offered to clients anywhere in the world. As the industry learns and follows suit with new technologies and methods, the sector as a whole will benefit.

These benefits will bring through faster, more efficient operations, with the sector able to function on a significantly more sustainable scale.

What are the barriers to adoption and how can they be overcome?

One of the greatest barriers to the adoption of USV technology is trust in relatively new technology. This is typical of the diffusion of innovation/technology adoption lifecycle. We have moved from the *innovators* to the *early adopters'* stage, and are now at the edge of *chasm*.

Click here for more information on the technology adoption lifecycle.

As USV technology is used on more and more commercial projects trust in the technology will increase and people will better understand the benefits it has to offer. However, to increase the use of USVs on commercial projects the systems as a whole need to be proven to be robust and reliable, including the various payloads that the USVs deploy.

If the required legislative framework is not put in place then businesses are missing an opportunity to sustainably extend the lifecycle of their existing infrastructure and will ultimately suffer from the strain of a growing global population.

How does a SEA-KIT USV launch and recover AUVs and why is this function required?

SEA-KIT USVs are designed to have a configurable payload area that can be fitted with bespoke Launch and Recover Systems (LARS), depending on the client's payload. These launch and recovery systems are controlled through a Remote Operation Centre.

Designing SEA-KIT USVs to be able to launch and recover payloads such as ROVs and AUVs opens up market opportunities and increases the vessel's versatility beyond standard surface-based survey, e.g. it can perform remote subsea operations, pipeline inspections etc.

How do SEA-KIT USVs manoeuvre and navigate?

These are uncrewed vessels, meaning that they are remotely controlled from operation centres, which can be anywhere in the world. Communication with and control of the vessel can be done through VSAT Irridium 4g 5g, Marine board band radio, depending on which network is the most suitable given connectivity, bandwidth, costs etc.

How are SEA-KIT USVs deployed and where can they be used?

SEA-KIT's X class USV fits in a 40 foot shipping container and so can be easily and cost-effectively transported around the world for rapid mobilisation. It has an extended endurance due to the use of a hybrid diesel/electric drive, which allows the vessel to operate further offshore for longer periods of time in a maximum sea state 6. The SEA-KIT X-class vessel can be certified by DNVGL or Lloyd's Register.

How long is the endurance of SEA-KIT USVs?

SEA-KIT USVs are designed to have no single point of failure and so offer a high degree of redundancy. The vessels run using a diesel/electric hybrid drive for long endurance and low fuel consumption. This means they are suitable for long-range, over-the-horizon deployment via satellite communication. SEA-KIT USV operators benefit from extended mission capability and minimised downtime as well as reduced costs. This is essential for increasing the adoption of USV technology as customers look to push USVs further offshore for longer periods of time and need to be assured of their reliability.

What kind of survey work can SEA-KIT USVs perform?

The SEA-KIT USV's gondola can take a range of multibeam systems and has already been used to house EM2040, EM304 and EM710.

It can launch/deploy and recover AUVs, including HUGIN, and so can perform any survey that a HUGIN is capable of.

It can launch/deploy and recover inspection-class ROVs, and so can perform any survey that an inspection-class ROV is capable of.

How are SEA-KIT USVs used for different missions?

SEA-KIT USVs have adaptable payload areas and so can be configured for many offshore tasks, including:

- Environmental protection
- Bathymetry
- Sea-bed survey
- Mine clearance

- Intelligence gathering
- AUV launch and recovery
- ROV operations
- Ocean science

SEA-KIT USVs are designed to execute multiple missions. They can be reconfigured to meet the requirements of various missions and use cases. These include maritime logistics, environmental management and the security and monitoring of offshore assets, as well as marine inspection and efficient survey of the earth's ocean floors. SEA-KIT USVs can be used as a single asset or as part of a larger group of vessels, acting as a multiplier complete work faster and at reduced cost.

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