

HYDRO INTERNATIONAL INTERVIEWS DAN HOOK, ASV.

Being Able to Look and Work Over the Horizon is Important



ASV (headquartered in the UK) is a pioneer in the world of Autonomous Surface Vehicles. It discovered the potential of vessels that do not need manpower on board for various tasks. It was not until a few years ago that these kinds of platforms started taking off, also in the hydrographic survey profession. Hydro International interviews Dan Hook, ASV's managing director, on various aspects, including operating beyond the horizon, communication and collaboration and regulations.

What attracted you to the autonomous surface vehicles business?

I could see that this was an area of huge unrealised market potential in the defence, oil and gas and survey markets. There was also no one else doing it.

You have been with ASV for 14 years. What main difference do you see in the vehicles?

Reliability and capability. The size of the vehicles has not changed much at all but technology is advancing very quickly; these vehicles have become much more reliable and capable of completing a wider range of tasks. ASV's initial venture into the market came about by supplying and operating remote controlled target drones in the UK. Since then however, we have moved onto producing much more complex vehicles for use in scientific research, surveys and oil and gas work. These vehicles, such as our C-Enduro and C-Worker, are capable of being at sea for longer periods of time and can house a range of different sensors and payloads.

How did ASV enter the hydrographic/ocean science market?

Although there is some overlap, these are two different markets. Our first project in the hydrographic market was the development of a semi-submersible craft fitted with a side-scan and multibeam sonar suite for the US Navy. Our first venture into the ocean science market came later when we were awarded an SBRI (Small Business Research Initiative) to design and build a long endurance USV for oceanographic applications, the C-Enduro. This was an Innovate UK funded project initiated by a requirement from the National Oceanographic Centre, supported by NERC and Dstl.

What do you think is the greatest step to be taken by autonomous surface vehicles, for surveying, in the near future?

The ability to operate safely over the horizon and beyond the line of sight from a support vessel will be a huge game changer for autonomous surface vehicles. ASV has recently been awarded funding from an Innovate UK maritime autonomy call to develop and prove the capability to operate USVs over the horizon. ASV will be working with Cranfield University, D-RisQ and Frazer Nash Consultancy on this project. One of the main challenges currently faced when looking to achieve over the horizon communications is the lack of regulatory guidelines. This will be one of the issues addressed in the research project and something that ASV is actively working on.

Will autonomous surface vehicles be able to replace traditional vessels?

I believe that USVs have the ability to complete a huge amount of tasks currently carried out using a manned craft. This has many benefits including freeing up these larger vessels to complete tasks such as deploying large ROVs or bottom sampling equipment for example. USVs can be used to complete the dull, dirty and sometimes dangerous tasks that are currently being carried out by manned vessels and in some cases, putting operators at risk.

Which limitation for research ASVs do you aim to solve first?

As already mentioned, the ability to operate safely over the horizon is an important aspect to look at. This requires developments in situational awareness, collision detection and avoidance and satellite communications.

The ASV vehicles use propulsion systems that require some power supply (diesel, electric) – the most independent vehicle runs for 3 months. Will ASV extend this?

Currently we do not see the need to operate a USV for a continuous period longer than 3 months. The reason for this is that the sensors and equipment fitted to the vehicle will require cleaning and servicing. Having said that, the way the technology is advancing, this requirement may soon be extended to a longer period of time.

ASV operates in several ASV markets: defence, science, offshore. Which market shows the most growth?

We are seeing equal growth in all sectors. I think this is a reflection of how the technology is advancing and the steady wider adoption of the use of Unmanned Surface Vehicles. We are investing heavily in our offshore products and are expecting considerable growth in this area in particular.

How do you see autonomous vehicles developing further?

There is potential for collaboration between unmanned vehicles. In the not too distant future I expect to see ASVs transporting, deploying, supporting and recovering AUVs for deepwater work. There is also the potential for ASVs to interface with UAVs (Unmanned Aerial Vehicles).

What kind of (simple) M&R jobs would an offshore vehicle like the C-Worker be able to do in addition to surveying and inspection?

Our initial focus for C-Worker has been deployment of a USBL for subsea positioning, multibeam echo sounder for inspection work, ADCP for environmental data gathering, PAM (Passive Acoustic Monitoring) for cetacean tracking, and the deployment of an inspection class ROV (Remotely Operated underwater Vehicle). When carrying out such tasks, C-Worker operates autonomously, following pre-programmed missions. For purposes of launch and recovery, we also operate the vehicle on a remote controlled basis.

Are unmanned surface vehicles having an impact on how survey companies nowadays work?

It is still a little too early to say, although we are noticing a change in the way shallow water surveys are being conducted. Areas of shallow-water can often be in dangerous and hard to reach places, with vehicles like our C-Cat 2, surveyors are still able to complete their work but without risking the health and safety of their operators. Using a USV in these situations also gives a greater degree of operational flexibility.

Will the role of the surveyors and geophysicists change in the future?

I can foresee that surveyors may spend more time onshore with remote data links from ASVs but their role will not change.

How will USVs and AUVs operate with each other in the future?

We are seeing a need for ASVs and AUVs to work together for Mine Countermeasure (MCM) applications and we expect to see this requirement grow in the science and oil and gas markets in the next few years. ASV, along with the National Oceanography Centre, Sonardyne and SeeByte, has won funding from Innovate UK to combine ASVs with AUVs into an integrated survey system to create a lower cost solution to marine surveying.

How do you prevent collisions with regular merchant vessels or yachts? And should there be damage caused by a collision, how would you assess the liability?

This is a difficult area as there are currently no clear regulations– that is also why ASV is investing considerable time and effort into safe operations. A key element to this is collision avoidance. At such a pivotal time for the unmanned marine industry, I believe safe and responsible operations and practices are vital. We are developing a Maritime Autonomous Surface Systems code of practice for safe and responsible operations which is being shared and made available to any interested parties in the industry. We are also an active and contributing member of the MAS regulatory working group which is looking to develop a best practice regulatory framework for presentation to the Maritime Coastguard Agency (MCA).