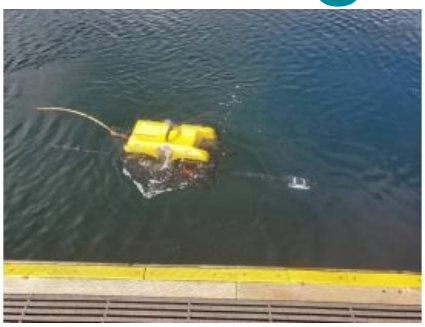
Seamor Marineâ€™s Chinook ROV enhances UXO detection with magnetometer integration



Seamor Marine’s Chinook ROV is making waves in the field of undetonated explosive ordnance (UXO) detection after successfully integrating a compact magnetometer together with subsea engineers at Ocean Floor Geophysics.

Magnetometers detect disturbances in the Earth’s magnetic field and are critical instruments for locating undetonated explosives along the ocean floor, referred to as UXOs by the military. Typically, magnetometers are bulky and towed by manned marine vessels or pickup truck-sized autonomous underwater vehicles (AUVs). They scan the seafloor through an arduous, time-consuming and expensive process.

The compact manoeuvrability offered by ROVs such as Seamor Marine’s Chinook ROV has always held great promise for subsea engineers designing magnetometer scanning systems. However, technicians have been challenged by the electromagnetic interference created by the electrical systems of these smaller units, until recently.

Mitigating potential electromagnetic field interference

Earlier this year, Seamor Marine was contracted by a private client through Ocean Floor Geophysics for a third-party integration of their magnetometer with the Chinook ROV. “Seamor’s Chinook is compact, manoeuvrable and reliable,” said Nathan Ehrenholz, subsea robotics engineer at Ocean Floor Geophysics. “It is the best ROV on the market at that price point for the sensitivity of work we are doing, and that is why we chose it to trial our magnetometer.”

Robin Li, president at Seamor Marine, explained that his team of engineers designed a custom extended attachment that holds the device far enough away from the ROV to mitigate potential electromagnetic field interference. “ROVs are complicated devices with many electronic and mechanical components. However, the carefully refined design of the Chinook meant very little baseline interference, which helped our magnetometer integration go smoothly.”

Most ROV pilots make use of the built-in movable camera during inspections and scans, but that was not an option for this trial. “The solution was to fix the camera in place, using the Chinook’s quiet thrusters to reposition the magnetometer while mapping, rather than relying on the pan/tilt feature of the built-in camera,” explains Li. “The submerged explosives might induce a flux of 5–20 nanoteslas, while the tilt mechanism might induce a flux of up to 500 nanoteslas, which is far too much interference to obtain accurate readings. I’m glad to say that, when put to the test, the magnetometer trial integration for the Chinook was a success.”

Green energy infrastructure

The potential of such an agile, portable and easily deployable magnetometer system extends well beyond military applications such as UXO detection. These instruments could provide critical support for green energy infrastructure, including offshore wind farms, and crucial location data for submerged fibre-optic cable lines.

“We are proud to see our Chinook ROV being deployed in groundbreaking ways,” stated Inja Ma, Seamor Marine CEO. “Our team deeply values both innovation and collaboration, so we are very excited to see what we have been able to accomplish in partnership with the engineering team at OFG. Furthermore, we are already looking to future collaborations with other innovators in the field of marine technology.”