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A NEW VISION FOR SUBSEA ASSET POSITIONING & CONSTRUCTION SUPPORT



BY SJOERD BUTTER,
*Project Owner Vision Technology,
Fugro*



Subsea installation projects have traditionally always called for bulky, and battery dependent positioning equipment to be affixed to the asset in question. This was always a time-consuming and risky operation. But as we continue to harness new ocean technology in the name of faster, safer, and more reliable offshore operations, it is time to disrupt legacy thinking and revolutionize subsea installations. Vision technology, which uses cameras as sensors to perform measurements or visualize future assets using augmented reality (AR), offers a more efficient and safer way to install and position subsea assets.

BENEFITS OF VISION-BASED SOLUTIONS

As Geo-data specialists, much of our thinking at Fugro canters around new ways and means to help offshore developers make real-time decisions about complex and technically demanding projects. When it comes to subsea infrastructure, we believe that underwater vision-based solutions not only help optimize personnel safety, but they also minimize overall vessel time given that the need to install and remove sensing hardware is eliminated.

The convenience of real-time touchless inspection and monitoring significantly reduces a project's complexity, accelerates turnaround times, and widens the operational weather window for essential tasks. At Fugro, we have seen first-hand how vision-based solutions can significantly reduce the required construction vessel time on subsea projects, and so consequently, drastically curb a mission's overall carbon footprint.

PRODUCT DEVELOPMENT

In recent years, therefore, we have seen more and more clients look for an alternative to mounting beacons and gyros to their subsea structures. This pushed our engineers to assess various robust and reliable alternatives and conceive a product that would ultimately standardize schedule im-

provements, while completely mitigating the risks of using fixed sensors on seabed structures.

The result was QuickVision®, a solution that provides accurate subsea asset positioning during subsea drilling and construction support operations. QuickVision® accurately measures and positions subsea assets by using a smart camera system—easily mobilized on any remotely operated vessel (ROV)—to acquire high quality imagery with precise timestamps and combines them with the ROV inertial navigation system, attitude and heading reference system, and vessel navigation systems.

INTUITIVE PATTERN TRACKING & AR

One area we have dedicated substantial resource to is developing a patented real-time pattern tracking feature. As an operational mode of QuickVision®, using these patterns only requires a dimensional control survey to provide the exact location of the pattern on the structure. The patterns are easy to produce, and multiple patterns can be used at the same time, introducing redundancy while also guaranteeing the structure can be tracked from all sides. These patterns enable a complete touchless approach and can stay on the structure once the project is finished.

We incorporated AR to enable the measurement of the subsea heading, attitude, depth, and position of structures without ROV intervention or additional equipment. The AR toolkit accurately mixes the reality of video with virtual measurement tools and enables users to replace physical marker buoys with virtual ones. This not only eliminates the risk of buoys detaching from the seafloor but removes the need for any physical installation in the first place.

As the ocean industries set sights on expanding further offshore, and into ever deeper waters, a new vision for marine asset positioning, construction, and integrity will likely prove instrumental.