

Subsea Navigation for Pipelay Vessel LV 108



Sonardyne, based in Houston, USA, has supplied acoustically aided inertial navigation technology to offshore engineering, procurement, construction and installation company McDermott International for its *Lay Vessel 108 (LV 108)*. The Sonardyne Ranger 2 Pro DP-INS system, the highest specification available from Sonardyne, is being used to support touchdown monitoring surveys of submarine cables, umbilicals and pipelines and as an independent position reference for the *LV 108*'s Kongsberg dynamic positioning (DP) system.

McDermott's *LV 108* entered service in 2015 and is currently on contract in the Ichthys field, Western Australia. Designed as a fast-transit, dynamically positioned (DP 2) vessel for subsea constructions support across a wide variety of water depths, the *LV 108* has 21,528 sq ft of deck space and can accommodate a crew of 129.

USBL Acoustics

Dynamically positioned construction and installation vessels such as the *LV 108*, conventionally rely on Ultra-Short BaseLine (USBL) acoustics and the Global Navigation Satellite System (GNSS) as their primary sources of position reference data. However, a vessel's station-keeping capability can be compromised in the event the USBL is affected by thruster aeration and noise and the GNSS signal is simultaneously interrupted. The latter is particularly common around equatorial regions and during periods of high solar radiation.

Sonardyne's Ranger 2 Pro DP-INS system addresses this operational vulnerability. It aids vessel positioning by exploiting the long-term accuracy of Sonardyne's Wideband 2 acoustic signal technology with high-integrity, high-update rate inertial measurements. The resulting navigation output has the ability to ride-through short-term acoustic disruptions and is completely independent from GNSS.

Positioning Performance

In addition to the system's deep water positioning performance and safety benefits, DP-INS has been proven to deliver valuable time and cost savings for vessel owners. It does not need a full seabed array of transponders to be installed and calibrated before subsea operations can commence. For most subsea tasks, positioning specifications can be met with only one or two transponders deployed on the seabed. Additionally, as the system needs only occasional aiding from the acoustics, transponder battery life is substantially increased and the need to task an ROV to deploy and recover transponders for servicing is reduced.

The equipment supplied to McDermott for the *LV 108* included Sonardyne's INS sensor co-located with the company's sixth generation (6G) [HPT acoustic transceiver](#). This hardware was installed on one of the vessel's two Kongsberg through-hull deployment machines and interfaced directly with the vessel's DP system, also supplied by Kongsberg.