Driven and Docking Piles Positioning & Metrology Services

Subsea ROV-aided Position, Elevation and Attitude Measurements,

ADVANCED SUBSEA Services are based on the following key features:

- **Field-proven methods optimized for project-specific requirements,**
- **Experts in acoustics involved at early stage of projects,**
- **Smart interfaces with Survey/ ROV spreads,**
- **Use of up-to-date software and hardware.**

This service is dedicated to Oil&Gas, Engineering&Construction, Drilling companies and is available in GOM, Brazil and West Africa -

1- LBL positioning

This service is based on the deployment of MF or LF acoustic arrays. Fit-for-purpose methods are implemented.

2- Elevation & Attitude Monitoring

Advanced Subsea proposes various methods based on ROV.
Sensors are selected in order to fit to project accuracy requirements

- Both absolute and relative depth/elevation are calculated.
- Attitude is calculated using inclinometers and gyrocompass.
- Depth/Elevation are measured using Digiquartz sensors.

For TLP Tendons Driven Piles, sensors are ROV-mounted or placed on ILT (Internal Lifting Tools) - stabbing, then on as-built measuring tools at end of driving.
For Structures Docking Piles, sensors are placed on frames operated by ROV

3- References in LBL

- Hybrid LBL methods for Deep Water projects :TFE Canyon Express, Girassol, Total Projects: Dalia, Rosa. Akpo, Moho-Bilondo Method Statements.
- Pile Installation position/attitude Control
  TFE Matterhorn TLP Piles Attitude/Position : Alternative Method Statement ,
- Conventional LBL operations and Subsea Metrology
  Castoro 8 Construction Support 1995-2002 :,
  Dalia Subsea Metrology, Moho Metrology,

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