Sonardyne
SOUND IN DEPTH

SUBSEA TECHNOLOGY

The use of hybrid navigation and positioning sensors to improve offshore efficiency

POSITIONING
NAVIGATION
COMMUNICATION
MONITORING
IMAGING

Sonardyne – A leading provider of underwater acoustic, inertial, optical and sonar technology

Sonardyne
SOUND IN DEPTH

70+
The number of countries where we operate

275
Sonardyne employees worldwide

46
The age of our company

10,000
Transducers manufactured each year

10mm
Positioning accuracy of 6G acoustic technology

156,000
Total square footage of our facilities

20Mb/s
The speed we can transfer data subsea

12,000m
How deep our equipment can operate

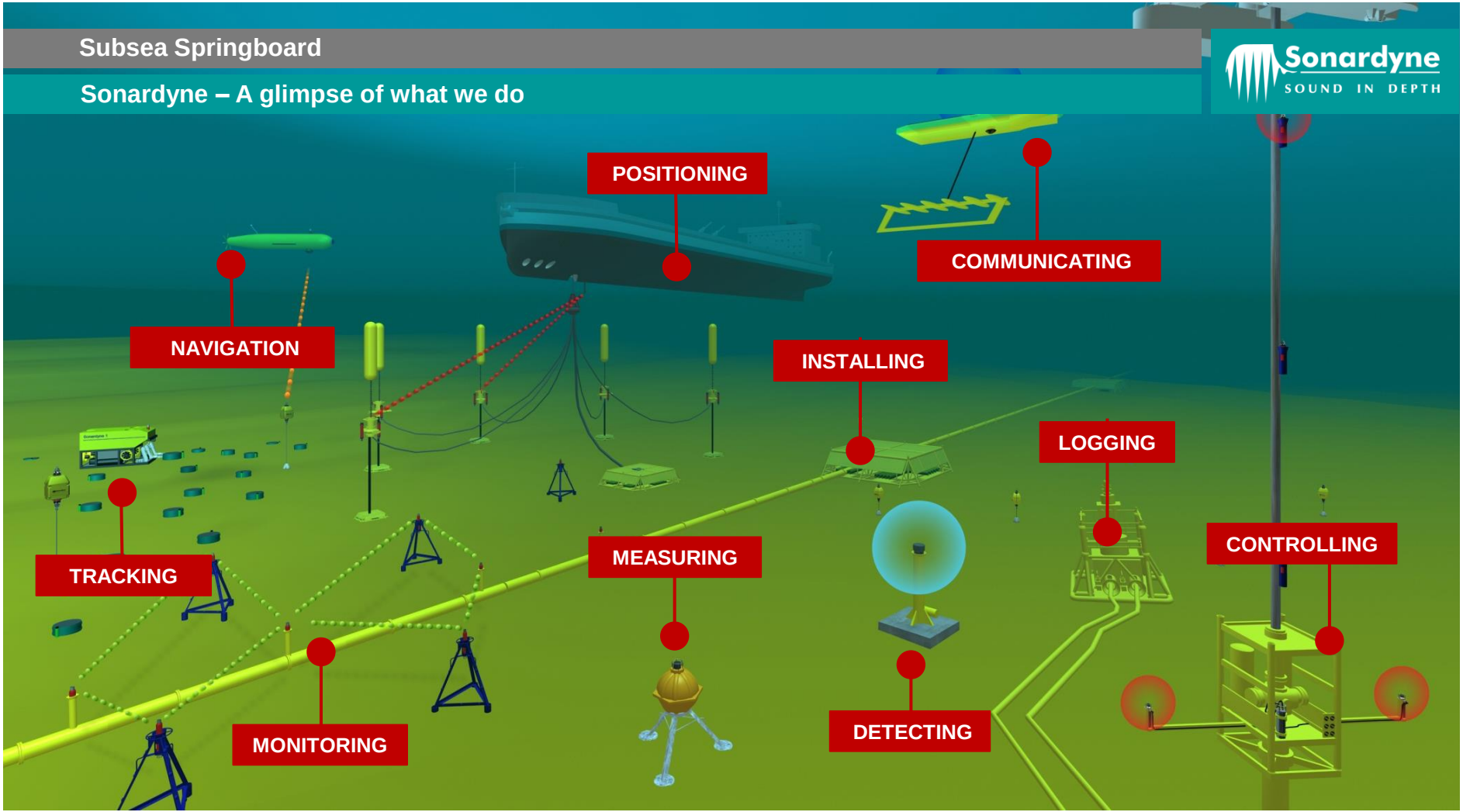
100%
Deep water fields where Sonardyne technology is used

80%
Percentage of products we export

24/7
Support any time you need it

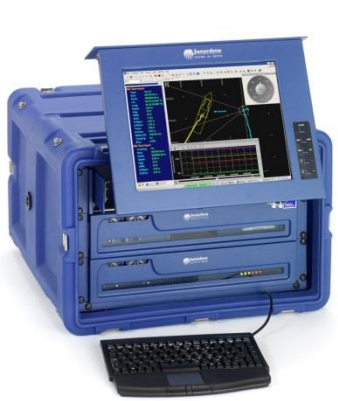
Subsea Springboard

Sonardyne – A glimpse of what we do



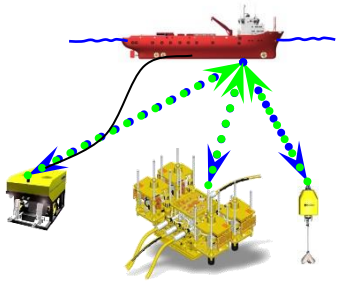
6G Technology – Hardware

- Launched in 2010
- Common hardware platform
- Simple and intuitive to operate
- All “speak” the same serial and acoustic command language
- Faster and more robust acoustic performance
- All capable of transmitting high data rate telemetry
- Multi User capability
- Many 6G products have additional features that can be remotely unlocked to increase their functionality
- Tight integration with Inertial Navigation Systems

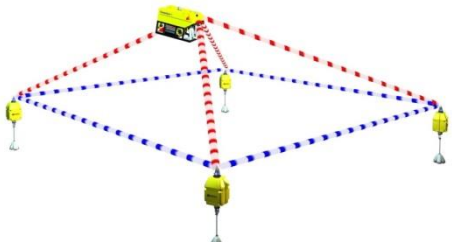


Subsea Positioning/Navigation Techniques

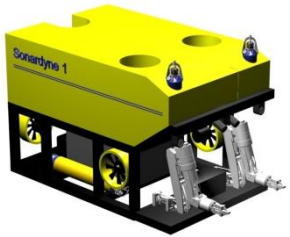
- Ultra-Short BaseLine (USBL)
  - Range/bearing from vessel to target
  - Simple to use
  - Accuracy is dependant on range/depth



- Long BaseLine (LBL)
  - Array of subsea transponders used to calculate target position via trilateration
  - Accuracy typically independent of depth
  - More complex than USBL



- Inertial Navigation Systems
  - Similar to ‘dead reckoning’
  - Typically used to accurately position ROVs with complimentary acoustic aiding solutions such as USBL, LBL and DVL



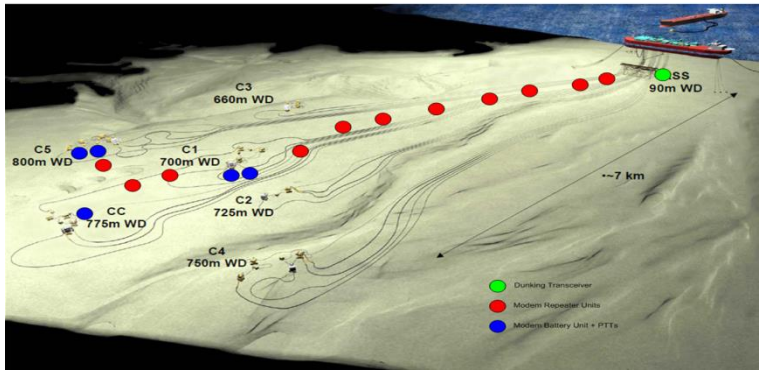
Subsea Springboard

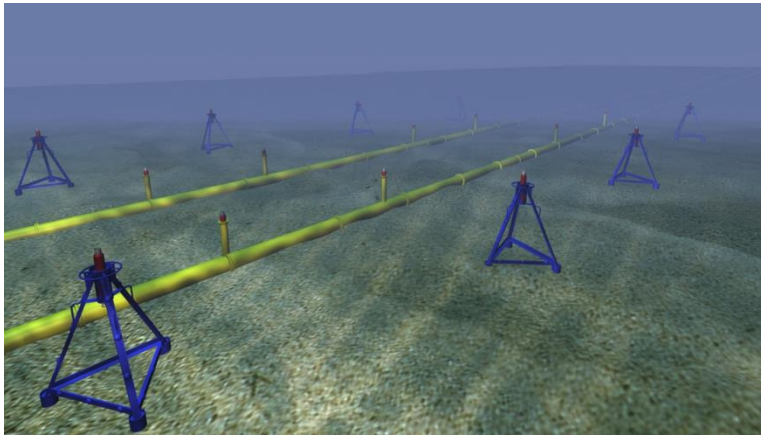
Acoustic/Inertial Positioning & Navigation Applications

- Subsea Survey/Construction
  - Structure Installation
  - Pipelay Operations
  - Metrology
  - Rock Dumping
  - Decommissioning
- Subsea Vehicle Tracking
- DP Operations
- Drilling/Production Vessels
- And many, many more!

6G Technology – More than just positioning and navigation…

- 6G transceivers & transponders can also:
  - Work autonomously
  - Log internal and external sensor data
  - Telemeter data from surface to subsea and vise-versa
  - Acoustically ‘hop’ data along the seabed or through the water column
  - Perform subsea data analysis
  - Perform remote command & control functions





Sonardyne
SOUND IN DEPTH

SUBSEA TECHNOLOGY

Case Examples

POSITIONING
NAVIGATION
COMMUNICATION
MONITORING
IMAGING

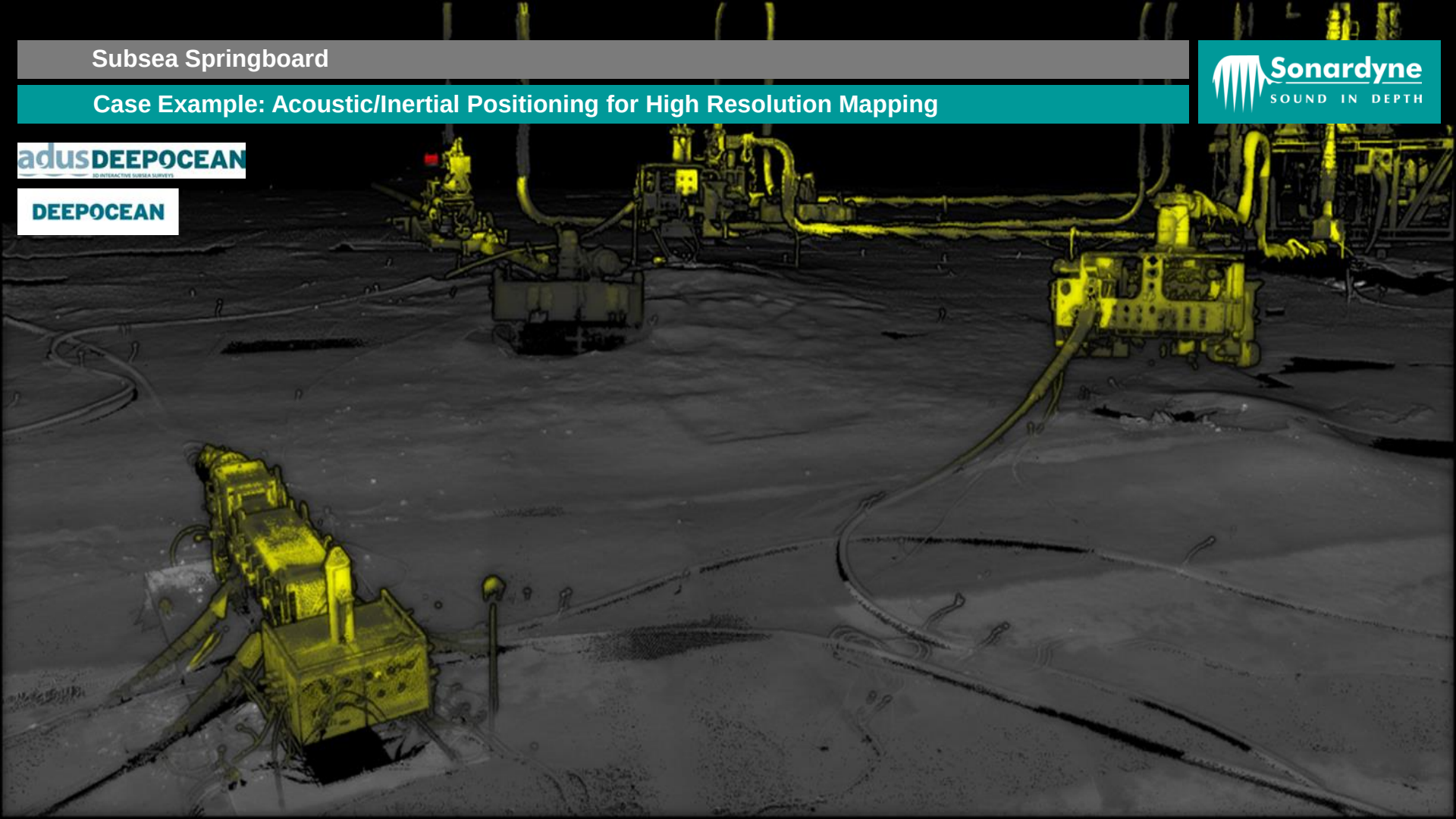
Subsea Springboard

Case Example: Acoustic/Inertial Positioning for High Resolution Mapping

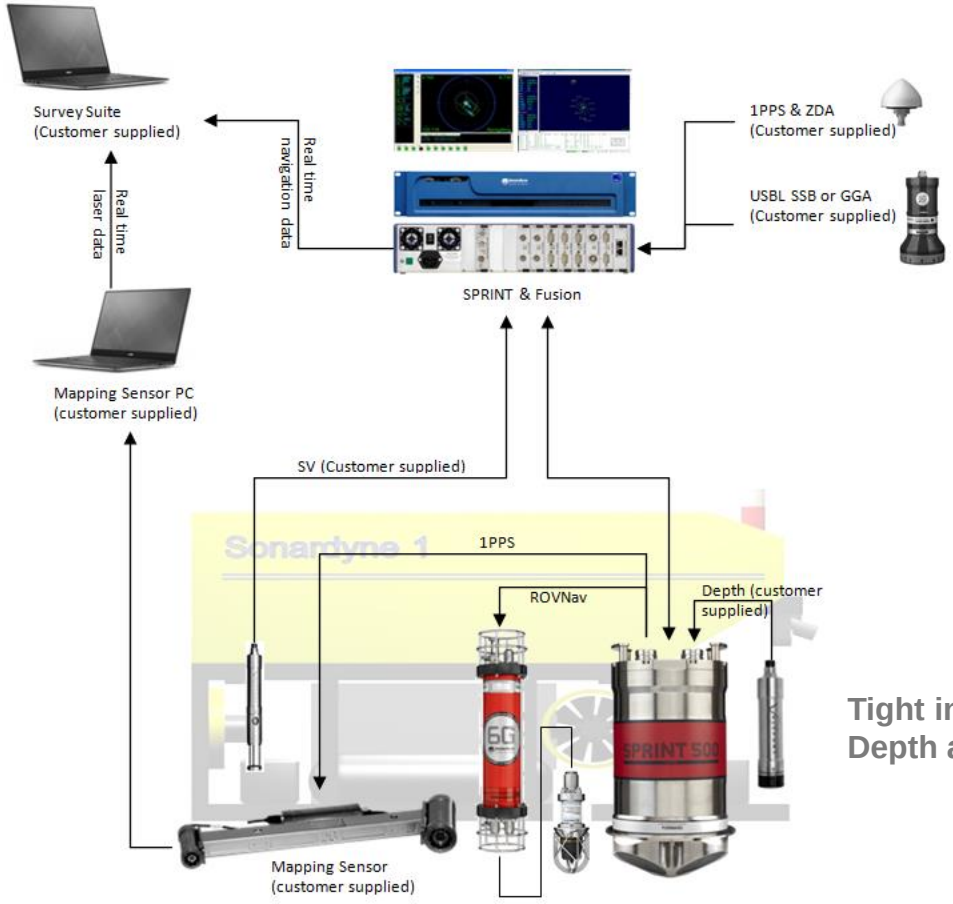
Sonardyne
SOUND IN DEPTH

adusDEEPOCEAN
3D INTERACTIVE SUBSEA SURVEYS

DEEPOCEAN



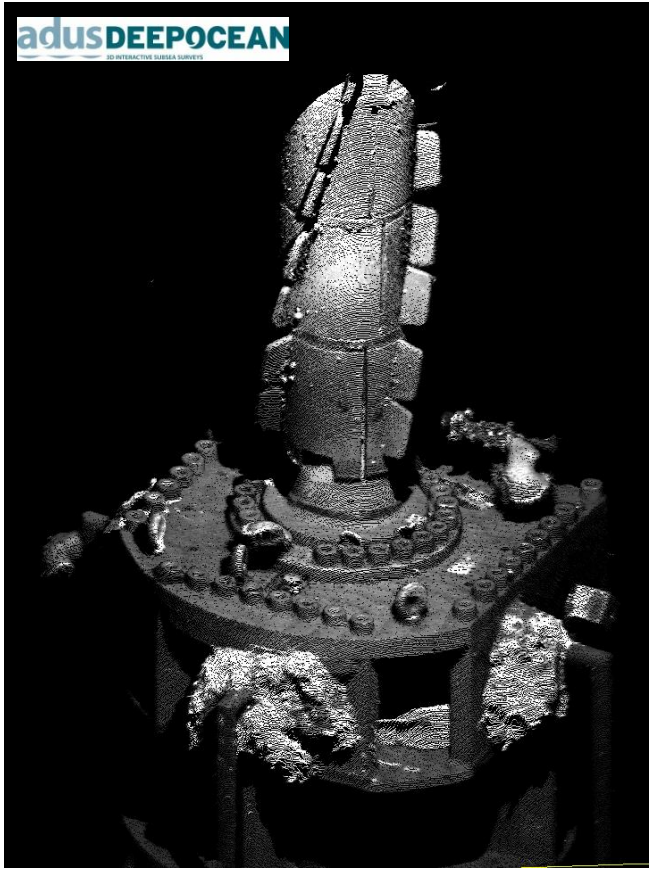
Case Example: Acoustic/Inertial Positioning for High Resolution Mapping

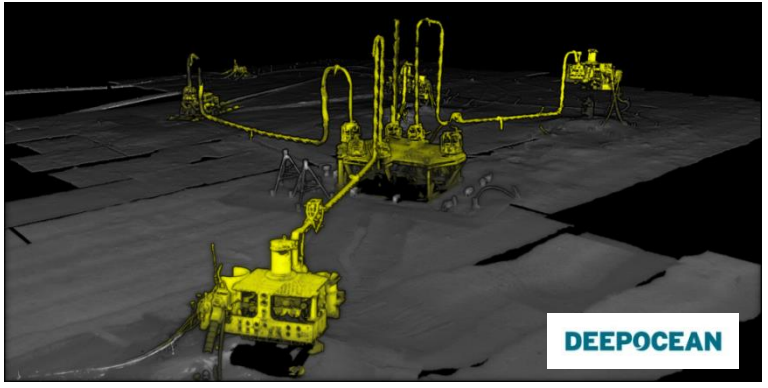


Tight integration of INS, DVL, LBL, Depth and Sound Velocity Sensors

Subsea Springboard

Case Example: Acoustic/Inertial Positioning for High Resolution Mapping

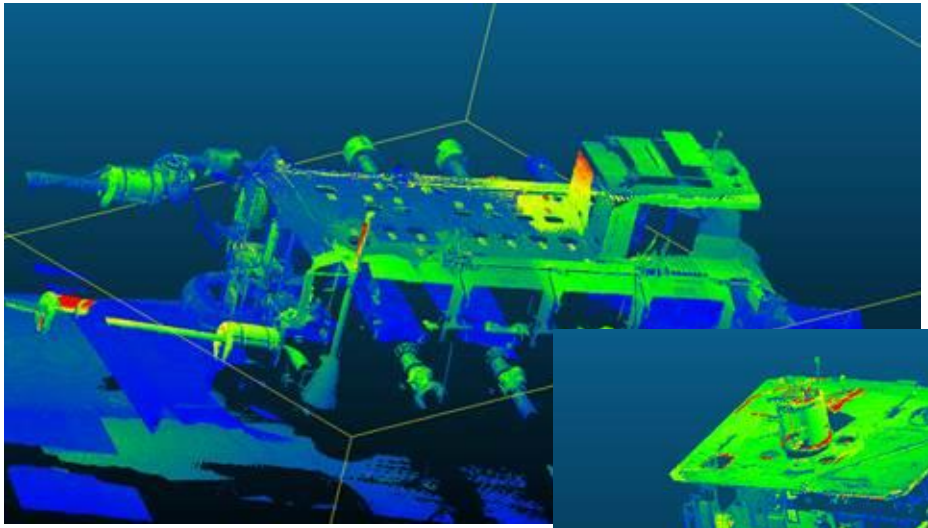


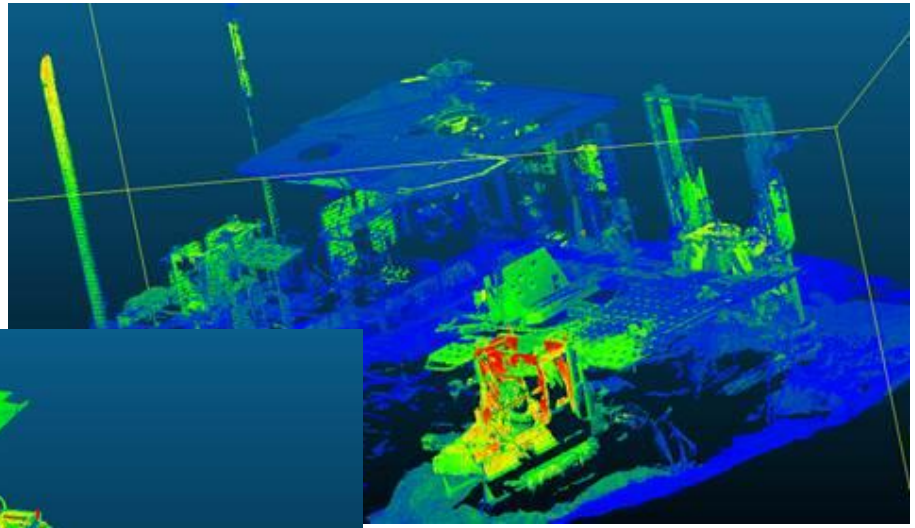


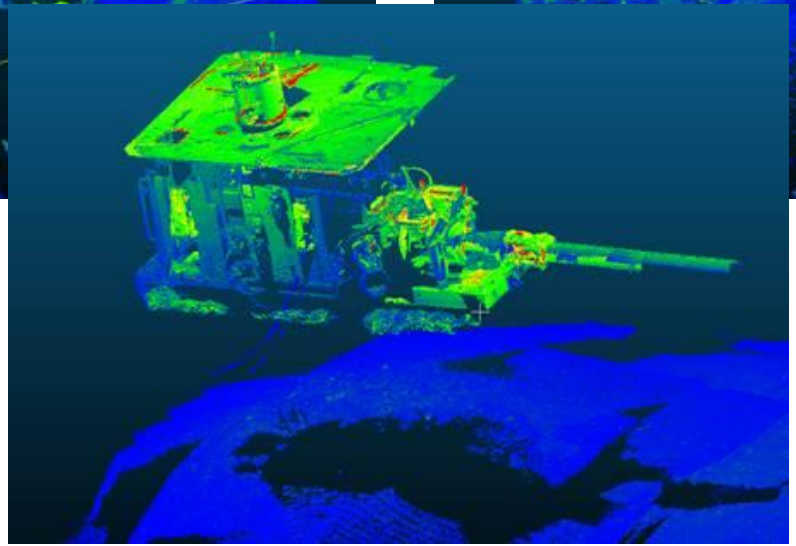
Subsea Springboard

Case Example: Acoustic/Inertial Positioning for High Resolution Mapping

Sonardyne
SOUND IN DEPTH



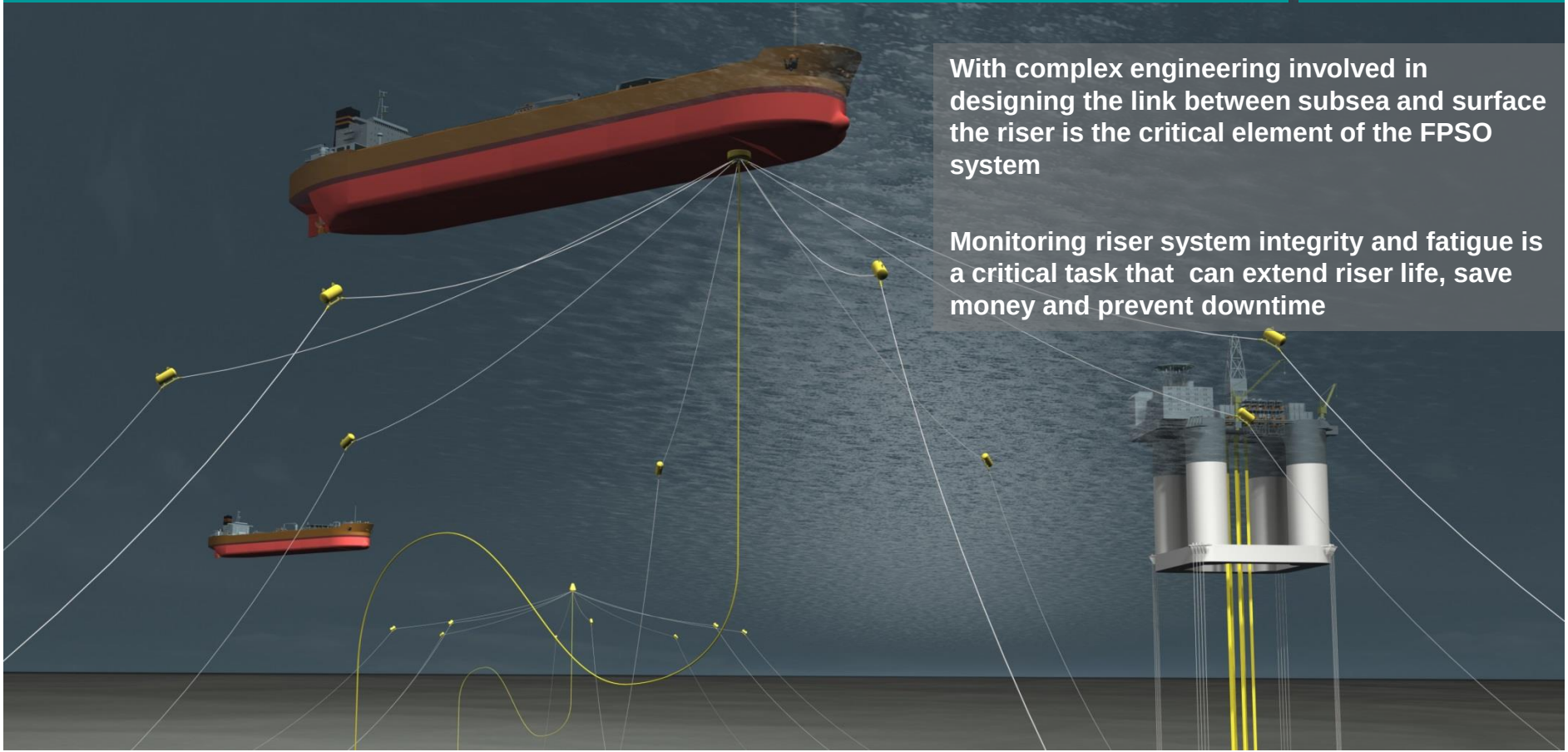




Subsea Springboard

Case Example: Production Riser Monitoring

Sonardyne
SOUND IN DEPTH



With complex engineering involved in designing the link between subsea and surface the riser is the critical element of the FPSO system

Monitoring riser system integrity and fatigue is a critical task that can extend riser life, save money and prevent downtime

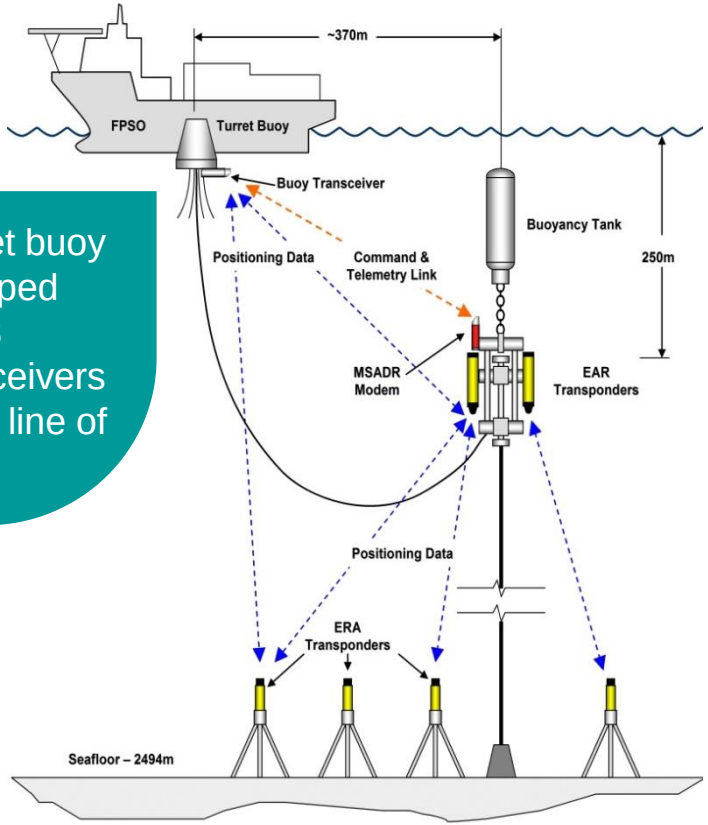
Case Example: Production Riser Monitoring

Sonardyne SOUND IN DEPTH

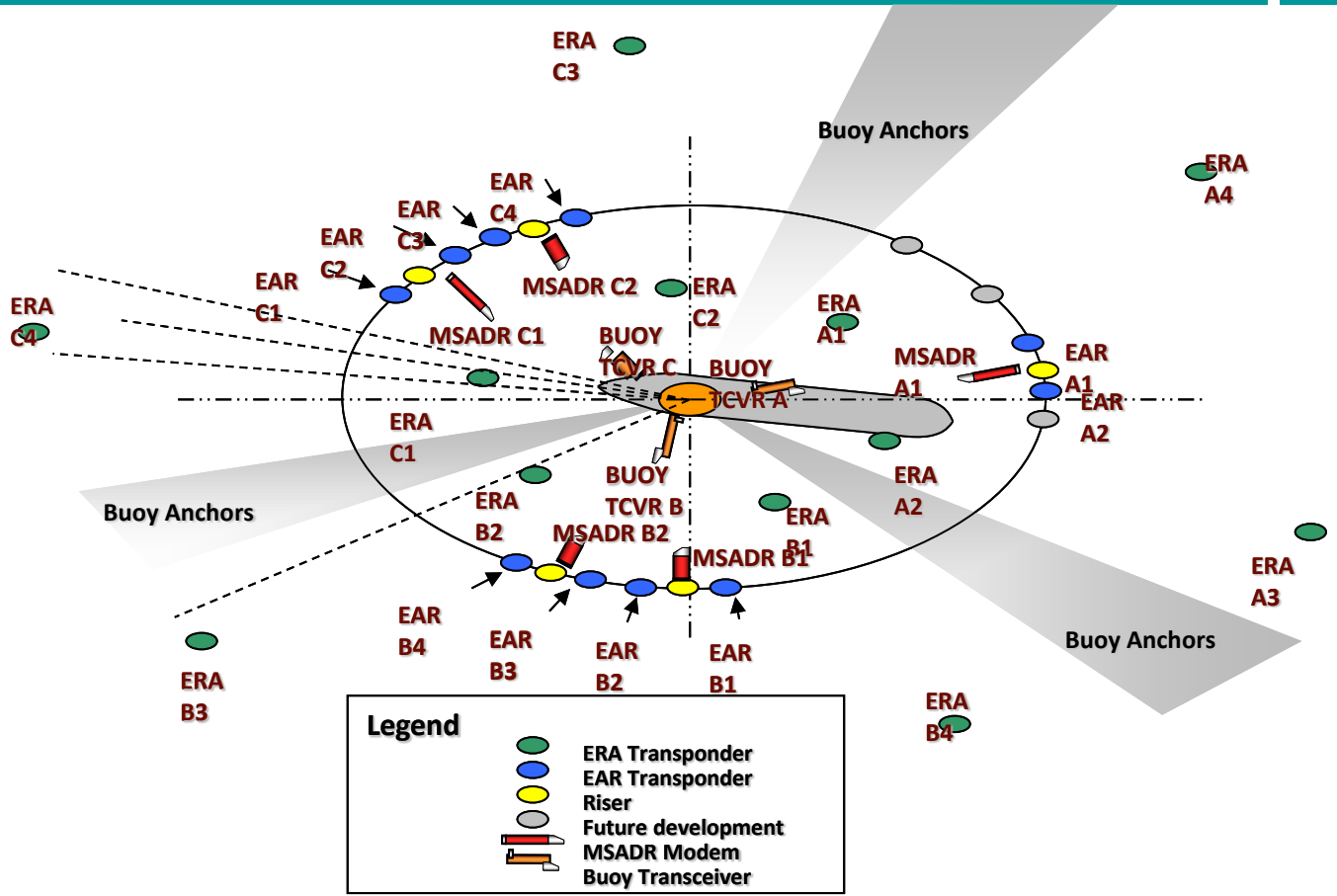
Overview

- Effective technology for Hurricane disconnect
- 3 Free Standing Hybrid Riser,
- Transceivers are on turret and data passed to FPSO when connected.
- Position the FPSO Turret buoy and riser tops relative to seabed array
- Depth, temp, inclination and SV data collected telemetered along with data from load and attitude monitoring system on each riser tower

"Turret buoy equipped with 3 transceivers to get line of sight"



Case Example: Production Riser Monitoring



Conclusions:

- The same core technology can be used across multiple phases of offshore field development, from initial installation of subsea infrastructure through to remote asset monitoring and decommissioning.
- Sonardyne's 6G technology can be (and is currently been) used to fulfil a variety of subsea positioning, navigation, data telemetry, remote command/control tasks.
- Operators, vessels, tier 1 contractors, survey companies, etc, can all use the same equipment to fulfil individual project requirements.
- Multi User functionality allows multiple users to simultaneously use the same subsea transponders.
- Our engineering expertise and capabilities allow us to offer bespoke solutions to meet the challenges of complex and demanding requirements.

Sonardyne
SOUND IN DEPTH

SUBSEA TECHNOLOGY

Thank you for your time today
Any questions?

SONARDYNE.COM

POSITIONING
NAVIGATION
COMMUNICATION
MONITORING
IMAGING