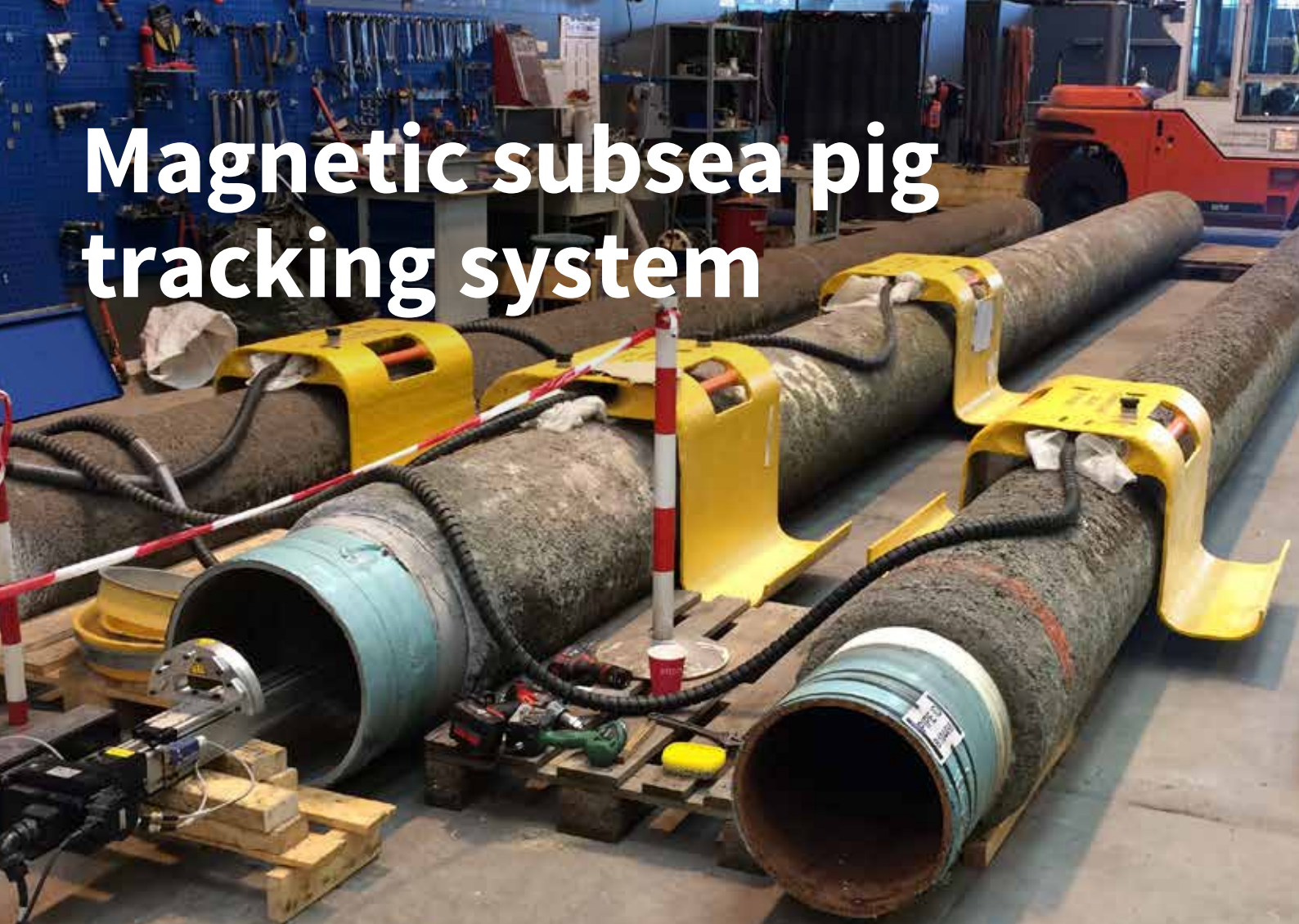


Magnetic subsea pig tracking system



Frequent pigging of pipeline networks requires a system for continuous pig tracking to avoid collision in pipeline Y-connections. The subsea pig tracking system is a key element in complex pigging, e.g. Subsea Automated Pig Launcher (SAPL).

Product benefits

System configuration flexibility

- Avoiding radioactive isotopes and therefore reducing handling costs and eliminating HSE issues
- Designed for use in different system configurations
- The tracker can be powered from an external power supply, or it can be delivered as a complete self-contained system with ROV display
- Simple start-up and operation

Compact and robust

- Qualified for use with permanently installed subsea equipment
- Robust detection of passing pigs, even at low speeds
- The measurement principle avoids error-prone calibration by customer

and allow compensation for surrounding magnetic fields

High reliability

- One tracker can be used to detect pig position and passage
- Sensing is based on measuring the presence and shape of a magnetic field. The magnetic field is measured by a 3-axis magnetometer
- The trackers are qualification tested according to ISO 13628-6

Low costs

- Low operational cost
- Include different options for pig tracking system

Improved reliability and safety

- Tunable detection threshold level
- Reliable detection
- Several system configurations supported
- The pig tracking system works on magnetic and non-magnetic pipelines
- No dangerous materials involved

Magnetic subsea pig tracking system

The pig tracking system offers more robust pig detection than competing trackers. The systems measure both high speed pig passage and stagnant pig positions within centimeters inside the pipeline.

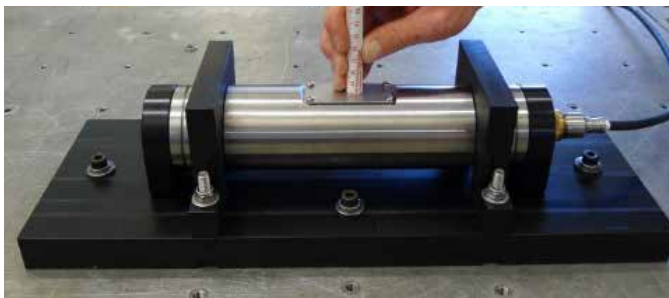
Advantages for both pig tracking systems include:

- Wax control
- Avoiding radioactive isotopes and therefore reducing handling costs and eliminating HSE issues
- Non-intrusive design as preferred for trackers in subsea pipeline systems; possible to retrofit
- Easy calibration and re-calibration. Automatic calibration on power-up can be implemented
- Robust and reliable technology qualified for permanent subsea use

Key elements

The magnetic pig tracking system comprises the following key elements:

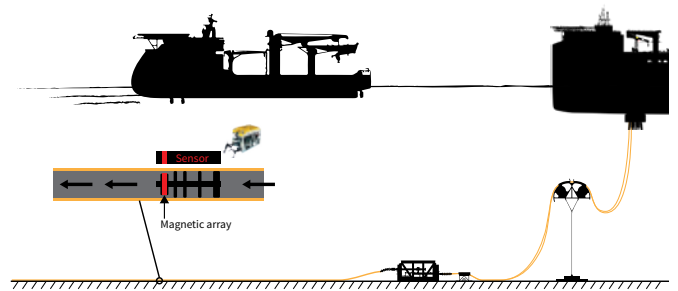
- Magnetic pig sensor with subsea pipe sensor clamps
- Magnetic pig arrays (to be mounted on pigs)
- Electrical jumpers with subsea connectors in both ends (depending on the sensor configuration)
- Onshore system testing/simulation
- Data processing unit



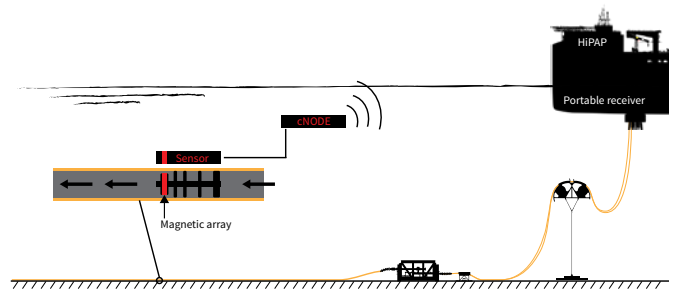
Three different system configurations for pig tracking:

1. Battery-powered with ROV display for temporary use
2. Acoustic communication link to vessel/platform
3. Connector interface for hardwired applications

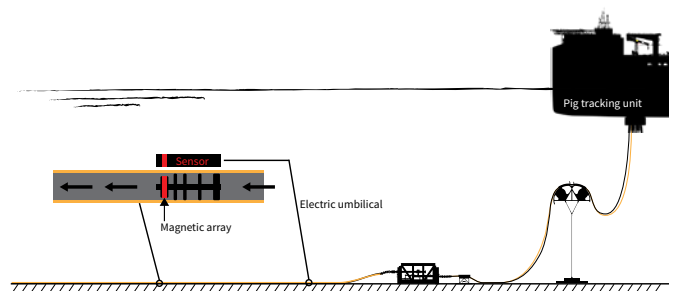
1. Battery-powered with ROV display for temporary use



2. Acoustic communication link to vessel/platform



3. Connector interface for hardwired applications



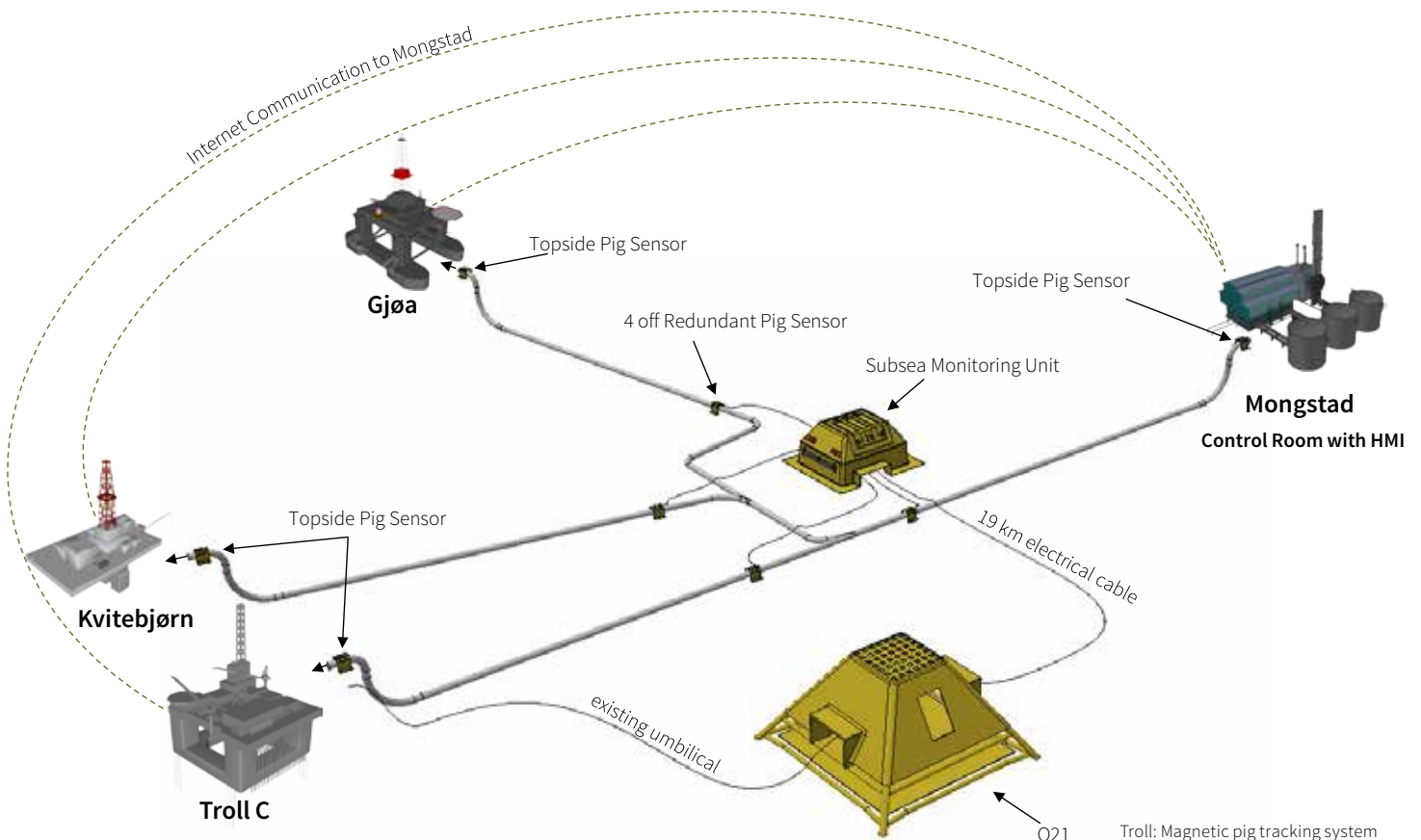
Magnetic subsea pig tracking system

Features

- Two operational modes; pig positioning and pig passage
- External power supply. Can be delivered as a complete self-contained system with ROV display
- Software can be embedded in sensor
- Fastening system: Stainless steel strapping (other options available at request)
- Roll, pitch and yaw measurements. supported (disabled by default)
- Maximum depth: 1000 m (up to 4000 m)

Technical specifications

ELECTRICAL INTERFACE:	Unshield 2 wire half Duplex RS485
VOLTAGE:	12 VDC
CONNECTOR:	GISMA 7 pin BR16 Gr.3
BAUD RATE:	19 200
DATA:	8 bit
STOP BIT:	1
SENSOR OUTPUT:	ASCII string consisting of 3 CSV (Ex:34555,1999,-244)
CERTIFICATION:	Nemko Q2, ESS (ISO 13628-6), NGL pressure 100 bars
DIMENSIONS:	Ø69 mm x 448 mm
WEIGHT:	5 kg (dry weight), 4 kg (submerged)
MATERIAL:	Titanium grade 2



Subsea Production Systems develops, produces and markets some of the strongest and most advanced subsea systems. Subsea Production Systems is a Business Unit in National Oilwell Varco (NYSE:NOV) which supplies customer-focused solutions that best meet the quality, productivity, and environmental requirements of the energy industry.

National Oilwell Varco
Drengsrudhagen 4, Asker
Akershus 1385, Norway



subsea@nov.com

nov.com/subsea

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