Subsea processing solutions to increase recovery for oil and gas fields
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Subsea compression and processing systems

- Solution for brown fields… increased recovery and debottlenecking topside
- Enabler for green fields… accelerated production and access to stranded reserves
Subsea gas compression applications and technologies
Subsea gas compression system application

- Increased recovery equivalent to discovering a new large field… 280 MMboe additional production
- Subsea facilities minimising impact on topside layout
From field development concept to complete system design...
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…Qualification – Ormen Lange Pilot experience
...and Project Execution – Åsgard experience

Project details
- Shut in pressure: 220 bar
- High power: 2 x 11.5 MW
- Flow rate: 21 MSm3/d
- Step-out: 40 km
- Water depth: 250 m

Project schedule
- 2006 - 2010: studies, pre-FEED, FEED
- 2010: EPC contract
- 2013: equipment testing
- 2015: delivery and start-up
New compression technologies development

- New technologies extending coverage... increased step-out distance and water depth
- Further optimisation of subsea gas compression systems through compact and simplified solutions
Subsea processing applications and technologies
Subsea processing system application

Mature oil field applications

- Additional production by subsea debottlenecking topside facilities
- Higher flow rate due to reduced wellhead pressure
- Increased recovery thanks to water injection
Qualified subsea gravity separation technology

- Subsea separation based on gravity technology
- Gas and oil can be routed in separate pipelines or comingled together
- Produced water can be reinjected from seafloor
- Solids can be routed with the oil or oil/gas mixture

FlexSep™ 3-phase separator… configurable system designed to meet specific well stream compositions and process requirements
Subsea separation system developments

- Developing a complete portfolio of building blocks for subsea separation system
  - Oil treatment
  - Water treatment
  - De-sanding

- Major R&D activities to extend applicability
  - Deep water installations
  - Complex reservoirs
  - High shut-in pressure
  - Strict environmental requirements
  - Arctic applications

- Compact modular system for complete life of field
Summary

- Attractive business cases for subsea gas compression and processing applied to oil and gas fields
- Proven system design, qualification and project execution capabilities
- New technology ensures extended range of applications… solutions suitable for smaller fields as well as large
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