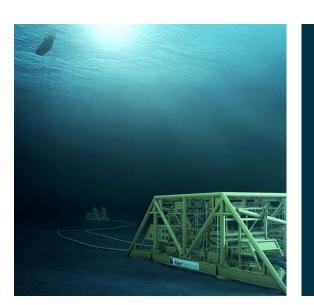


Preferred partner



Reliable **subsea** production solutions









# **Aker Solutions' subsea business**

#### Tokyo, 25<sup>th</sup> February 2016

Brad Cowain | Vice President of Subsea Lifecycle Services APAC

#### Ingenuity delivered: subsea production system





#### This is Aker Solutions



Employees: 16,000 Revenue: 33.0 bn EBITDA: 2.7 bn EBIT: 2.0 bn Market Cap: 6.6 bn

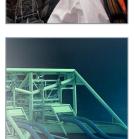
Revenues and profits are in NOK and are based on the annual results for 2014. Market capitalization as of January 8, 2016.

- Aker Solutions is a global provider of products, systems and services to the oil and gas industry
- Built on more than 170 years of industrial tradition
- Employs approximately 16,000 people in about 20 countries



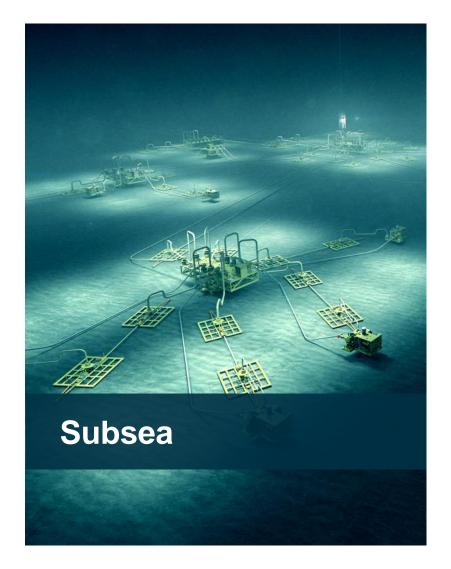








#### **Advanced Subsea Technology and Field Design**







#### Aker Solutions' subsea business in brief



- Top-tier subsea production system provider
  - 7,000 skilled and dedicated employees + 1,500 temporary staff worldwide
  - Revenue of NOK 19 bn (2014)
- Comprehensive subsea product and operations portfolio
  - Global manufacturing and service infrastructure
  - Project references and installed base in all regions
- Leading position on new subsea technologies



#### Aker Solutions' combined subsea strength





- Technology and competence
  - Industry leading front-end organisation
  - Most complete product portfolio
- Execution
  - Systems and scale to design and deliver next generation subsea projects
  - In-house delivery and integration capacity
- Locations
  - Capabilities to deliver projects in all regions
- Service
  - Capabilities to service installed base in all regions





#### **Ingenuity delivered**

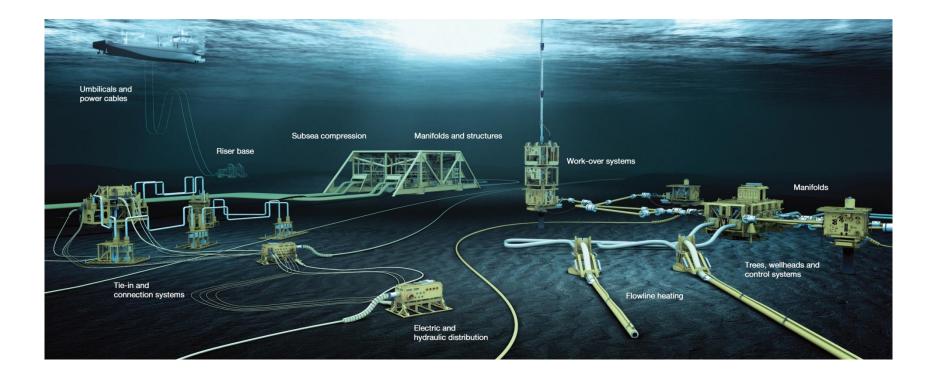




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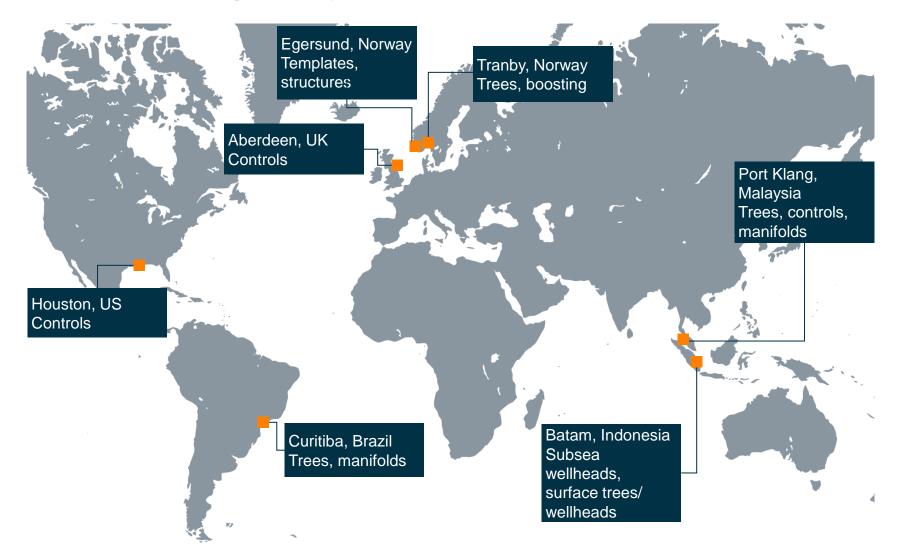
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#### Offering a complete technology portfolio





#### Manufacturing in key locations



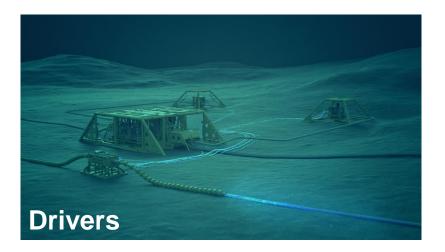


#### **Global service base infrastructure in place**





#### **Drivers and technologies of future field developments**





- Deeper waters, complex reservoirs, harsh fluids and longer step-outs
- Drive for increased oil recovery from existing fields
- Reduce costs to drive marginal developments

- New subsea processing and boosting solutions
- Reduced development cost through standardised and reused solutions
- Innovative service offerings



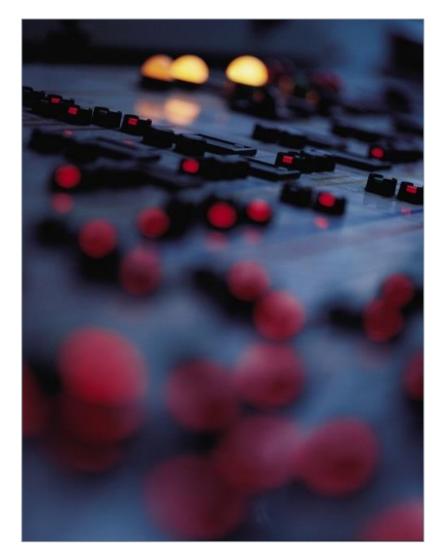


## Our technology and service portfolio



## **Control systems**

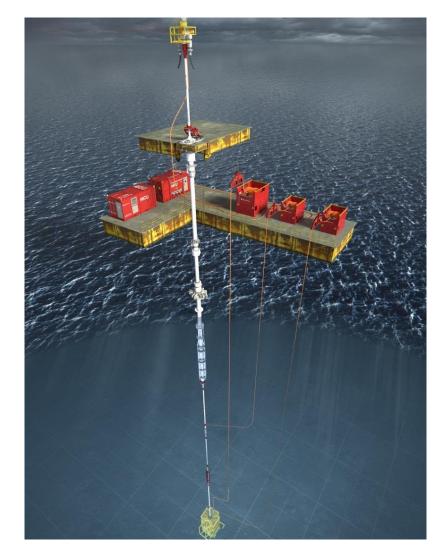
- We have installed more than 1,500 control systems since the mid-1970s
- Our new system Nexus 6<sup>™</sup> (intelligent control) takes us to another level of service provision
- We offer:
  - Nexus 6<sup>™</sup> subsea control modules
  - Nexus 6<sup>™</sup> subsea electronic modules
  - Subsea Nexus 6<sup>™</sup> control unit
  - Flow measurement systems
  - Pressure protecting systems
  - Topside equipment





#### Intervention and workover systems

- Aker Solutions' designs cover ranges from shallow water to deepwater developments at depths of 3,000 metres
- We offer:
  - Intervention tooling
  - Open water light well intervention systems
  - multiWOCS<sup>™</sup>
  - Riserless systems
  - Through tubing rotary drilling systems
  - LARS systems
  - Jack-up rig systems
  - Landing string systems
  - Unique X-vendor architecture allowing us to perform installations and maintenance on any subsea tree from any subsea vendor





#### **Manifolds and structures**

- We provide solutions for all water depths, installation methods and seabed conditions in any part of the world
- We offer:
  - Overtrawlable templates and manifolds
  - Deepwater cluster manifolds
  - Satellite protection structures
  - Moonpool installable structures
  - Pipeline-end manifolds (PLEM)
  - Pipeline-end terminations (PLET/FLET)
  - Flowbases and guidebases
  - Riser bases
  - Process support structures





#### **Power and processing**

- Aker Solutions is an awardwinning industry leader in processing and boosting solutions
- Our products have been proven to increase oil recovery in the most demanding conditions
- We offer:
  - DeepBooster<sup>™</sup>
  - FlexSep<sup>™</sup>
  - GasBooster<sup>™</sup>
  - Power distribution systems
  - Condition monitoring





### Subsea boosting

- Aker Solutions offers unique MultiPhase boosting technology capable of handling high gas volume fraction (GVF) while providing high pressures
- Field-proven single phase boosting
- Reliable and robust systems with state-of-the art condition monitoring
- Modular, inter-changeable and standardised range of products to cater to full life-of-field needs
- System delivery of complete standalone pump stations
- We offer:
  - LiquidBooster™
  - HybridBooster<sup>™</sup>
  - MultiBooster<sup>™</sup>





#### Subsea trees

- Aker Solutions has provided subsea trees to offshore operators for more than 20 years
- We consistently develop and adapt our products to our customers' demands
- We have deployed more than 700 subsea trees around the world
- We have a strong global footprint of manufacturing and service locations supporting our customers





#### Subsea wellhead products

- Aker Solutions is a leading supplier of engineering, manufacturing, installation and lifeof-field support of subsea wellheads worldwide
- We focus on the optimisation of wellhead design, drilling and operational cost, with safety being intrinsic in the process
- Our unique hanger system makes our wellheads suitable for exploration and production in even the most extreme conditions and water depths
- We offer:
  - Wellhead systems
  - Wellhead tooling

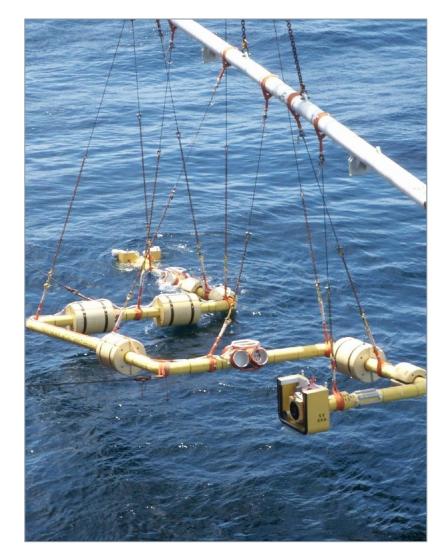
  - Casing hangers and pack-offs Wellhead drilling and subsea tree connectors





#### **Tie-in connection systems**

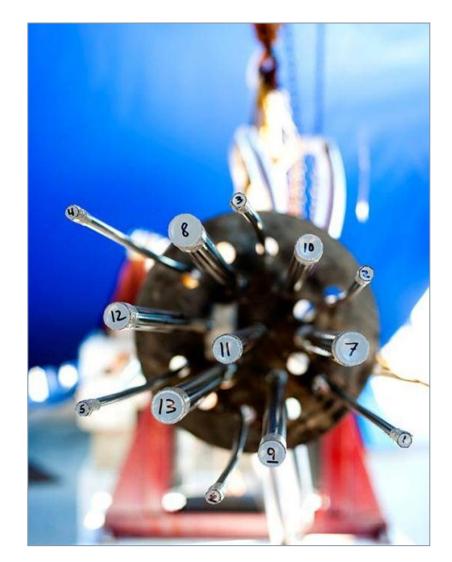
- Aker Solutions has approximately 30 years' experience delivering reliable and cost-efficient tie-in connection systems and tools
- Our systems are based on standard components and interfaces which provide maximum flexibility during installation
- We offer:
  - Diverless connection systems
  - Connectors
  - Tools
  - Jumpers





#### **Umbilicals and power cables**

- Aker Solutions provides umbilicals, power cables, risers, and flow-line heating systems for subsea production applications
- Each unique umbilical package utilises our custom profiling approach to hold each element inside the umbilical within a floating matrix configuration
- The result is the ultimate in geometric flexibility, to help safeguard your valuable assets and secure your production success





### Subsea lifecycle services (SLS)





## Subsea lifecycle services (SLS)

- Through our regional service bases and central support we can deliver globally integrated subsea lifecycle services
- We offer:
  - Installation and commissioning of systems
  - Rental of installation and intervention tools
  - Intervention support
  - Maintenance, repair and spares supply
  - Refurbishment and recertification
  - Customer property management, including storage and preservation
  - Operational and technical support
  - Re-supply of brownfield equipment
  - Manpower support
  - Integrated operations
  - Condition monitoring





#### Acquired specialty technology companies

- Enovate (UK) the world's toughest well control technology
- Enovate has developed a wide range of unique and patented components and products for use in
  - open water workover systems
  - riser workover systems
  - rigless intervention systems
  - drilling safety systems

- Benestad (Norway) the world's best electrical and signal penetrator technology
- Highly specialised materials science company
- Delivers high technology products for hostile, extreme pressure and high temperature subsea environments

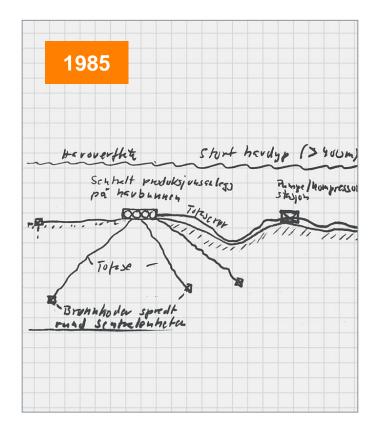


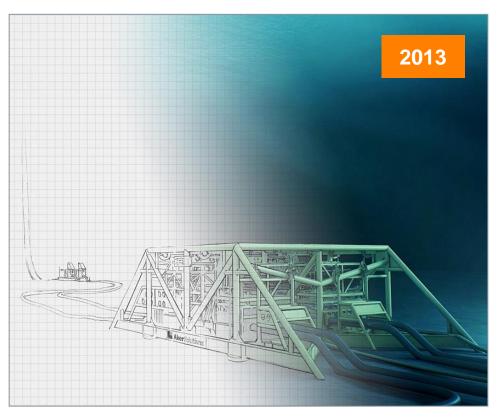


## Subsea – case studies



#### The world's first subsea compression system





In 1985 one of our engineers made a quick sketch on a napkin. At the time the technology didn't exist.

**Today** that idea is reality. The ground breaking subsea gas compression system is a world first and a technological leap.



### Subsea gas compression: a technological revolution

- Gas fields require boosting of the reservoir flow as reservoir pressure depletes
- Subsea gas compression replaces the need for an offshore platform or onshore compression facility
  - Cost-effective development solution (CAPEX)
  - Reduced operational costs (OPEX)
- Advantageous to place the compressor close to the well
  - Increased and accelerated production
  - Reducing CO2 emissions through lower energy consumption
  - No emissions or disposals to sea
- Safer due to unmanned operation





#### Aker Solutions gas compression portfolio



# Ormen Lange pilot wet-gas compression system

- 120 km step out (separate contract)
- Subsea VSDs
- Water depth 1,000 meters
- 2 x 12.5 MW subsea compressors\*
- Production 21 mill Sm3/d \*
- \* Pilot has only 1 train

#### Åsgard wet-gas compression system

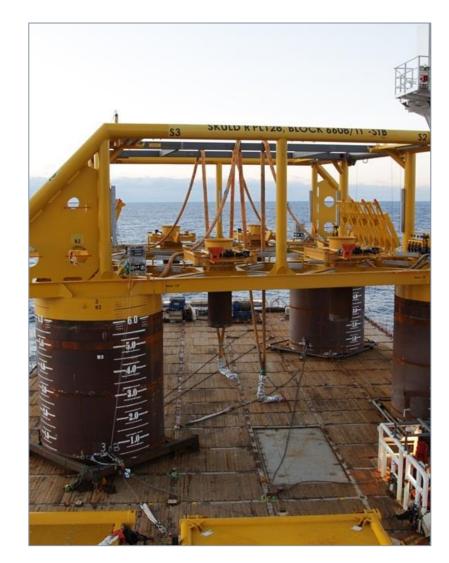
- 40 km step-out
- Topside VSD
- Water depth 250-325 meters
- 2x11.5 MW subsea compressors
- Production 21 mill Sm3/d





### Fast track projects

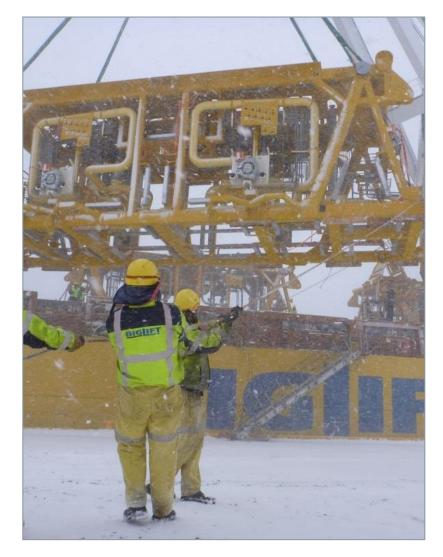
- Executing projects faster while maintaining the same high quality
- We have developed a standard catalogue for subsea production systems (SPS) to meet this need
- Compressing the conceptual and tendering stages
- Development based on standard equipment;
  - Critical supply items can be preordered earlier
  - Simplified work processes
  - Re-using drawings
- The result is faster project execution and lower cost





#### Large conventional projects

- Aker Solutions has experience with developing large conventional projects in every corner of the globe, working with various clients to increase oil recovery
- Our experience spans from shallow water to the ultra-deep and from tropical conditions to the harsh conditions of the Arctic. We have the experience and the know-how to get our customers to where they want to be





#### **Subsea Gas Compression: Vision to reality**





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