Aker Solutions’ subsea business

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Ingenuity delivered: subsea production system
This is Aker Solutions

- 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

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.
Advanced Subsea Technology and Field Design

Subsea

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

“Subsea factory ready”
Ingenuity delivered
Offering a complete technology portfolio
Manufacturing in key locations

- Egersund, Norway: Templates, structures
- Tranby, Norway: Trees, boosting
- Aberdeen, UK: Controls
- Houston, US: Controls
- Curitiba, Brazil: Trees, manifolds
- Batam, Indonesia: Subsea wellheads, surface trees/wellheads
- Port Klang, Malaysia: Trees, controls, manifolds
- Tranby, Norway: Trees, boosting
- Aberdeen, UK: Controls
- Houston, US: Controls
- Curitiba, Brazil: Trees, manifolds
- Batam, Indonesia: Subsea wellheads, surface trees/wellheads
- Port Klang, Malaysia: Trees, controls, manifolds
Global service base infrastructure in place

- Houston, US
- Rio das Ostras, Brazil
- Pointe Noire, The Republic of the Congo
- Luanda, Angola
- Aberdeen, UK
- Fornebu, Norway
- Limasol, Cyprus
- Kakinada, India
- Kuala Lumpur, Malaysia
- Labuan, Malaysia
- Perth, Australia
- Aagotnes, Norway
Drivers and technologies of future field developments

Drivers

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

Key in solving challenges

- New subsea processing and boosting solutions
- Reduced development cost through standardised and re-used 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™ (intelligent control) takes us to another level of service provision
- We offer:
  - Nexus 6™ subsea control modules
  - Nexus 6™ subsea electronic modules
  - Subsea Nexus 6™ 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™
  - 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 award-winning industry leader in processing and boosting solutions
- Our products have been proven to increase oil recovery in the most demanding conditions
- We offer:
  - DeepBooster™
  - FlexSep™
  - GasBooster™
  - 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 stand-alone pump stations
- We offer:
  - LiquidBooster™
  - HybridBooster™
  - MultiBooster™
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 life-of-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
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

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

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
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 pre-ordered 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.
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