

Because the seafloor is the new surface

Subsea production and processing systems

Transferring subsea production and processing systems to the seabed helps operators produce more oil and gas from the world's offshore reserves. Our portfolio includes power and deaerator, boosting systems, and a full range of subsea processing equipment. We are also expanding our operations to include new and complex projects of an unprecedented scale and complexity.



www.akersolutions.com/subsea

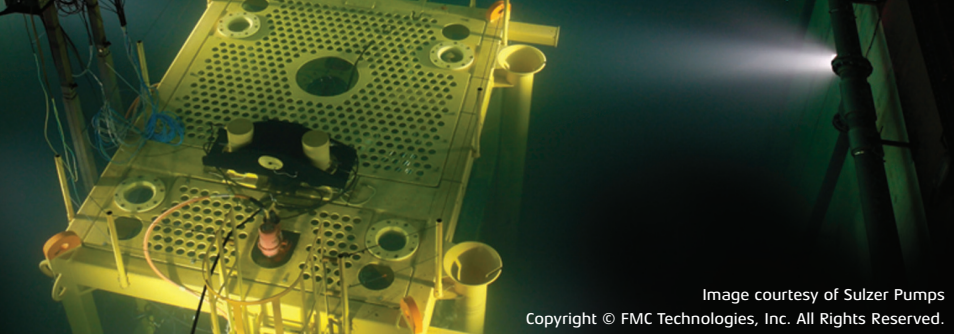
Don't just scratch the surface



www.genesisandgas.com

More powerful pumps:

Maximize production now.



FMC Technologies

We put you first. And keep you ahead.

www.MaximizeRecovery.com

2014 WORLDWIDE SURVEY OF SUBSEA PROCESSING, SEPARATION, COMPRESSION, AND PUMPING SYSTEMS

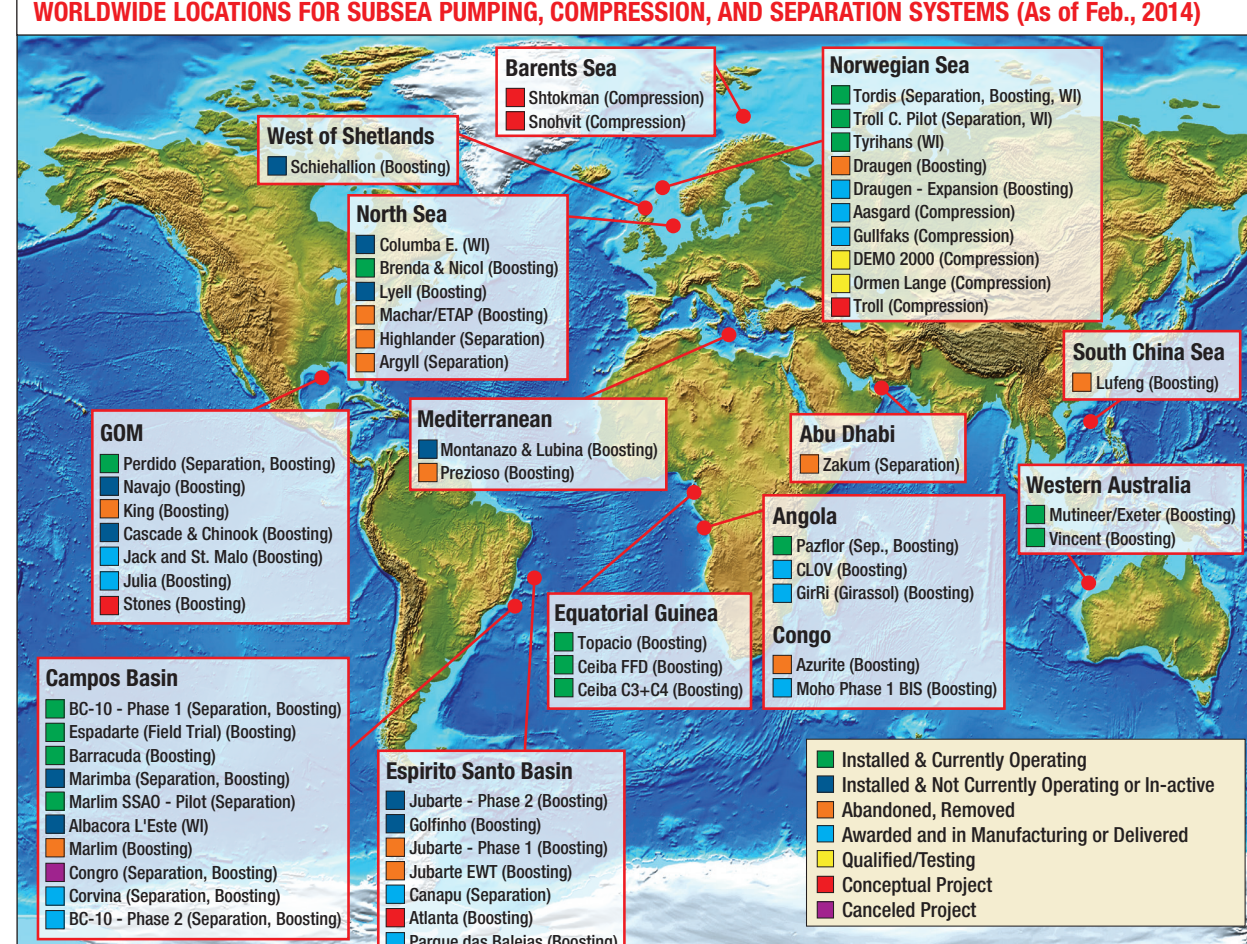
STATUS OF THE TECHNOLOGY

MARCH 2014  
Larry Forster, Thiago Mesquita, Paul, Richard Volpert, Spiridon Ionescu, John Allen, RJ Baker, Rachel Townsend, Julie Burke and Mac McKee of INTECSEA, E. Kurt Alford of Repsol & P USA, and David Davis of Offshore Magazine  
Poster Assembled By: Chris Jones of XenonGroupDesign.com  
Digital Images by: Sid Aquire of C-Ray Media  
E-Mail Comments, Corrections or Additions to: sp@intecsea.com  
To Download a PDF, go to: www.offshore-mag.com/posters.html or www.intecsea.com/publications/posters



INTECSEA and Offshore Magazine wish to acknowledge the following companies and individuals who continue to support our efforts to educate and inform the oil & gas industry on the status of subsea processing technologies. We are grateful for the time and effort of all those who have supported this project. We are also grateful for the time and effort of all those who have supported this project. We are also grateful for the time and effort of all those who have supported this project.

WORLDWIDE LOCATIONS FOR SUBSEA PUMPING, COMPRESSION, AND SEPARATION SYSTEMS (As of Feb., 2014)



POSTER COLOR KEY

Table 6 - ACRONYMS & ABBREVIATIONS

AC	Artificial Lift	AS	Artificial Seals
AD	Artificial Deaerators	AS	Artificial Seals
AD	Artificial Deaerators	AS	Artificial Seals

7 - OTHER INFORMATION SOURCES

Table 7 - Other Information Sources

Source	Description
AS	Artificial Seals
AS	Artificial Seals

CHART 1 - SUBSEA SUPPLIER MATRIX (As of Feb., 2014)

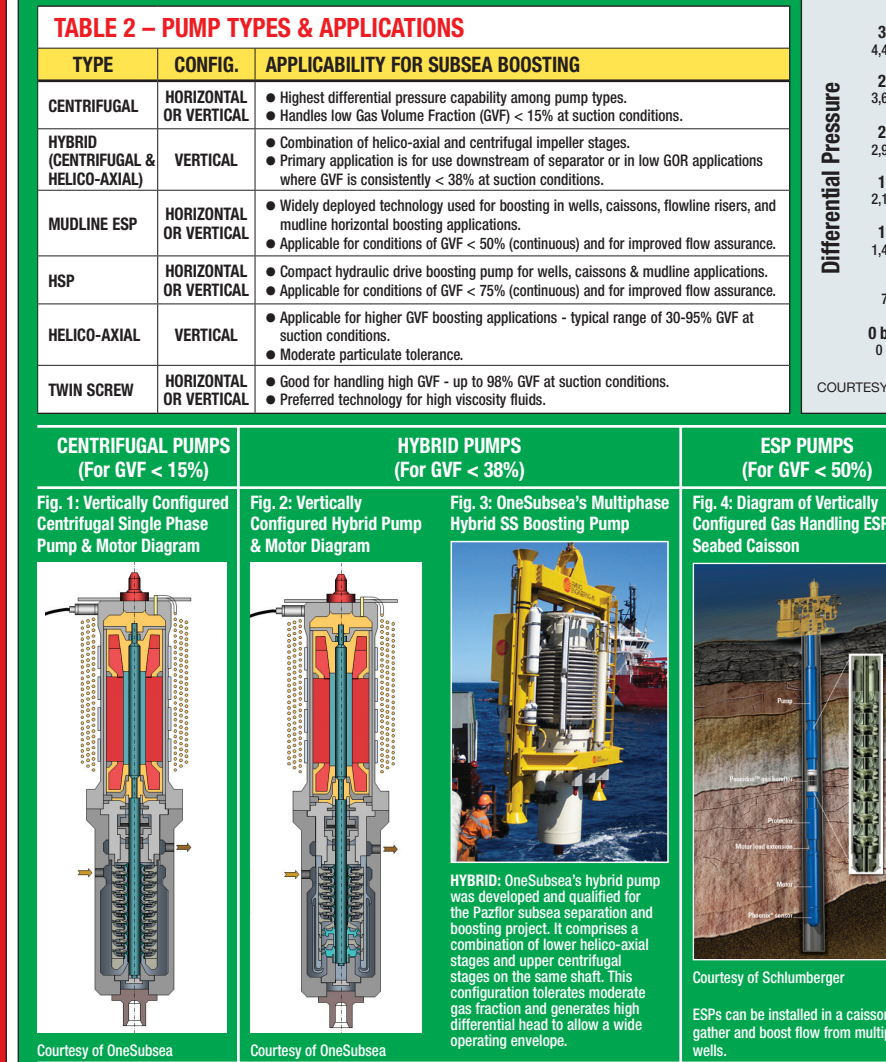
Table 1 - Subsea Supplier Matrix

Supplier	Subsea Processing	Subsea Separation	Subsea Compression	Subsea Pumping
Company A	Yes	Yes	Yes	Yes
Company B	Yes	Yes	Yes	Yes

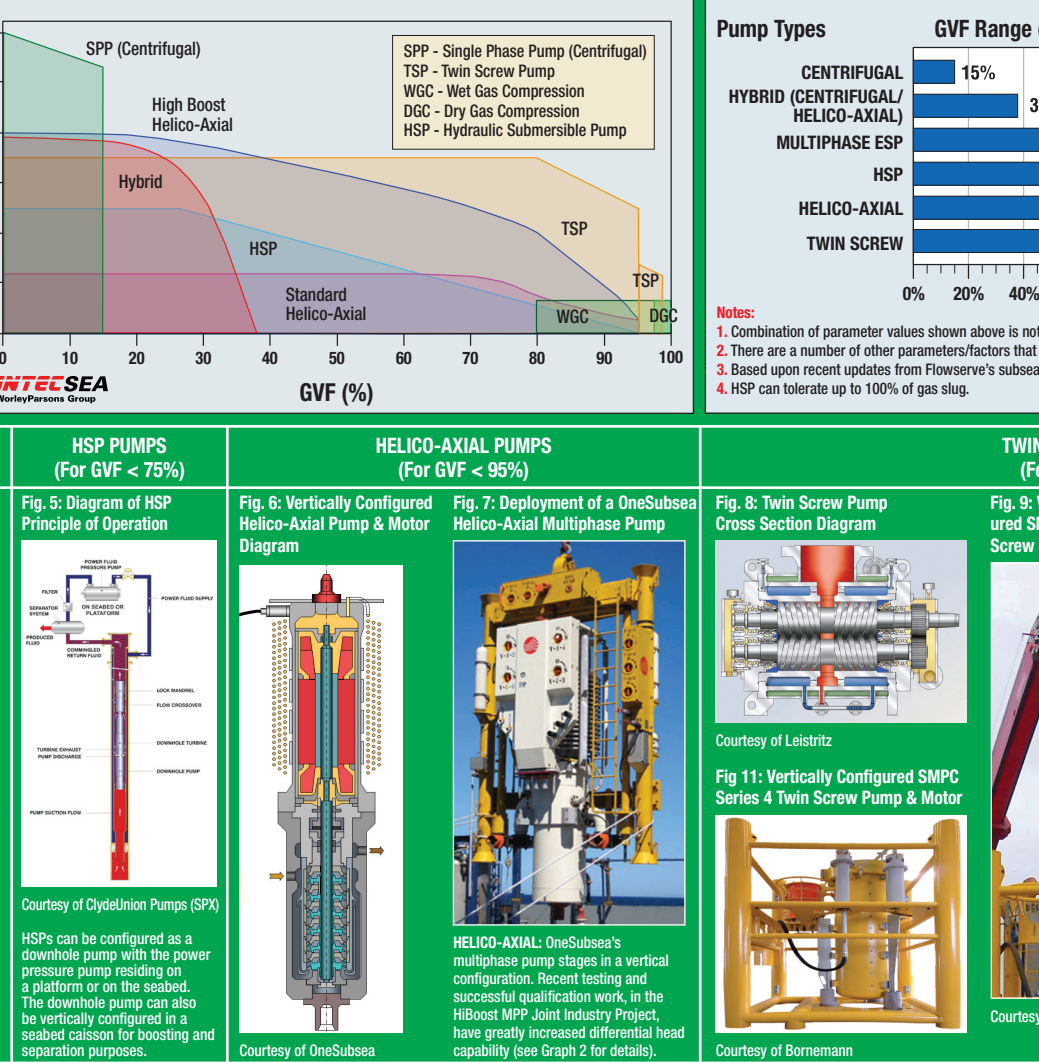
SUBSEA GAS COMPRESSION SYSTEMS & PRODUCTS BY COMPANY



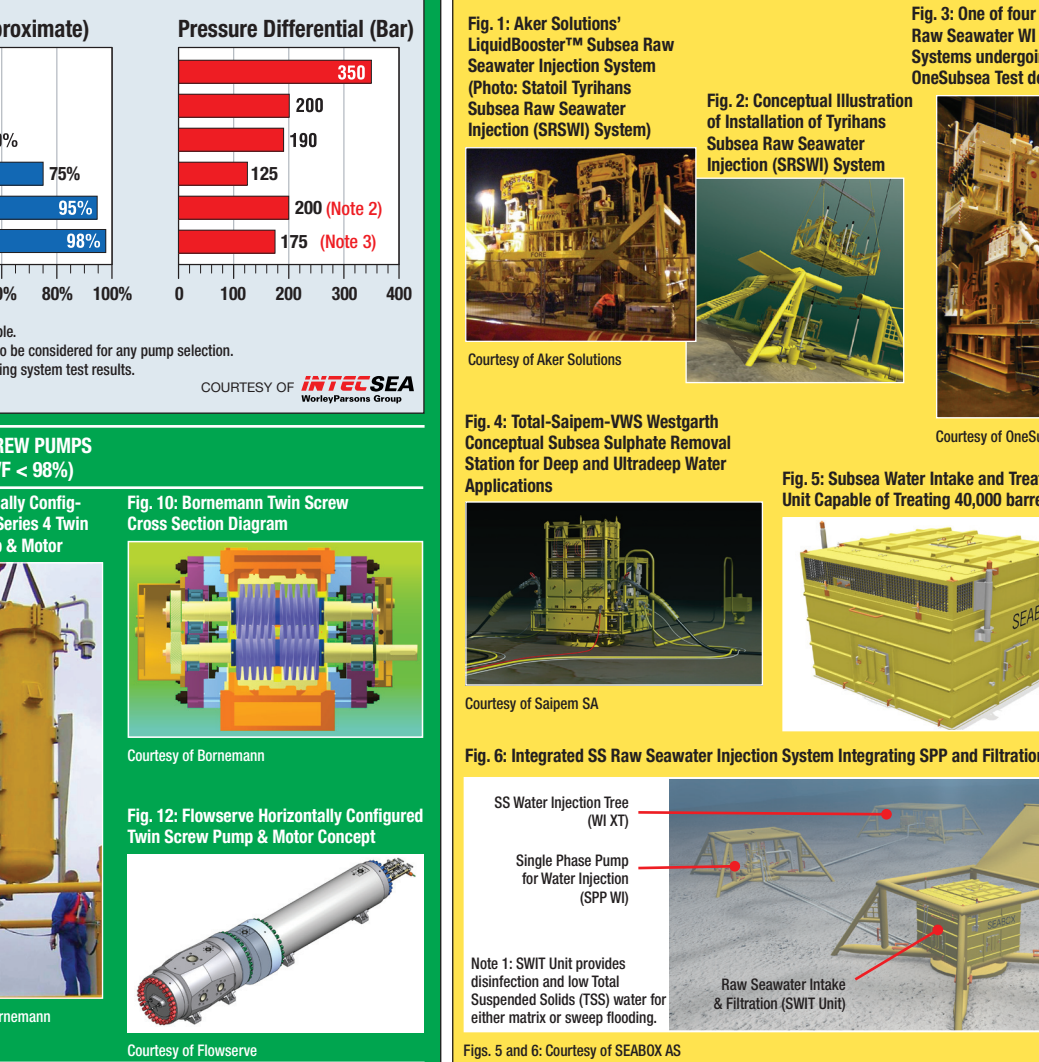
SUBSEA BOOSTING PUMP TYPES



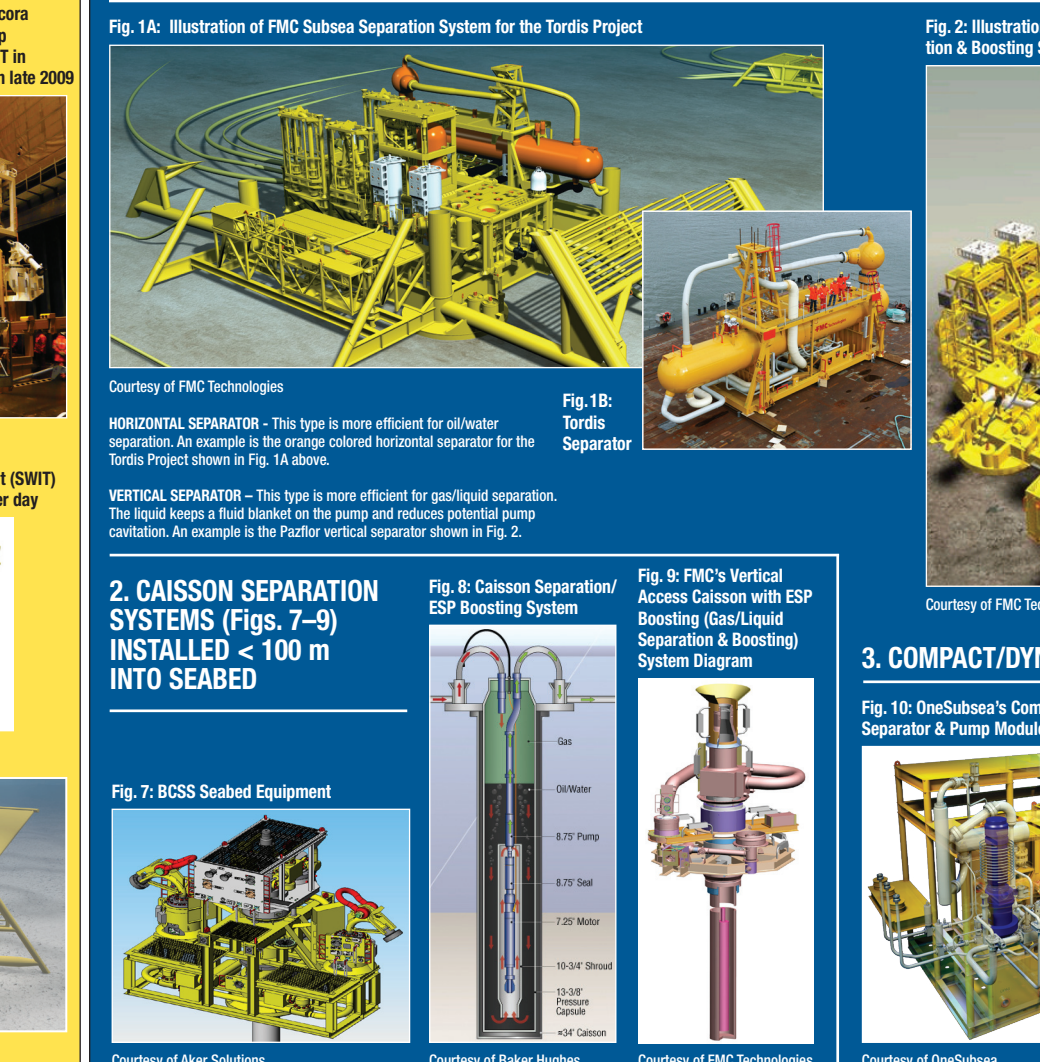
SUBSEA SEAWATER INJECTION AND TREATMENT



SUBSEA SEPARATION SYSTEM TYPES: 1. GRAVITY SEPARATION SYSTEMS (Figs. 1-6)



SUBSEA SEPARATION SYSTEM TYPES: 2. CANNON SEPARATION SYSTEMS (Figs. 7-9)



SUBSEA SEPARATION SYSTEM TYPES: 3. COMPACT/DYNAMIC SEPARATION SYSTEMS (Figs. 10-12)



TABLE 1 - 2014 WORLDWIDE SURVEY OF SUBSEA GAS COMPRESSION, BOOSTING, WATER INJECTION, AND SEPARATION (1)(2) - As of Feb. 2014

Table 1 - 2014 Worldwide Survey of Subsea Gas Compression, Boosting, Water Injection, and Separation

PROCESSING/COMPONENT	FIELD OR PROJECT (Ordered by Start Date)	CURRENT STATUS	OWNER/ FIELD OPERATOR	REGION/ BASINS	WATER DEPTH (Meters/ Feet/ Km/ Miles)	TIEBACK DISTANCE (Meters/ Feet/ Km/ Miles)	SYSTEM FLOW RATE (OLINE CONDITIONS)	DIFFERENTIAL PRESSURE	NO. OF PUMPS/ UNITS	PUMP TYPE/ COMP. TYPE	COMPRESSOR/PUMP MANUFACTURER	IN-SERVICE OPERATING INFORMATION	
SUBSEA GAS COMPRESSION	1. DEMO 2000	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	2. Ormen Lange Gas Compression Pilot	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	3. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	4. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	5. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	6. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	7. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	8. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	9. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%
	10. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00	0%

TABLE 2 - 2014 WORLDWIDE SURVEY OF SUBSEA GAS COMPRESSION, BOOSTING, WATER INJECTION, AND SEPARATION (1)(2) - As of Feb. 2014

Table 2 - 2014 Worldwide Survey of Subsea Gas Compression, Boosting, Water Injection, and Separation

PROCESSING/COMPONENT	FIELD OR PROJECT (Ordered by Start Date)	CURRENT STATUS	OWNER/ FIELD OPERATOR	REGION/ BASINS	WATER DEPTH (Meters/ Feet/ Km/ Miles)	TIEBACK DISTANCE (Meters/ Feet/ Km/ Miles)	SYSTEM FLOW RATE (OLINE CONDITIONS)	DIFFERENTIAL PRESSURE	NO. OF PUMPS/ UNITS	PUMP TYPE/ COMP. TYPE	COMPRESSOR/PUMP MANUFACTURER	IN-SERVICE OPERATING INFORMATION
SUBSEA SEPARATION	1. DEMO 2000	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	2. Ormen Lange Gas Compression Pilot	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	3. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	4. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	5. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	6. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	7. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	8. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	9. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00
	10. Ormen Lange Gas Compression	Operational	Statoil	Offshore Norway	300	2,671	0.0	25,000	2776	60.0	879	12.00

TABLE 3 - SURVEY OF SUBSEA ELECTRICAL POWER CONNECTOR AND FCES FACTORS

Table 3 - Survey of Subsea Electrical Power Connector and FCES Factors

Connector Type	Manufacturer	Rated Voltage (kV)	Rated Current (A)	Rated Power (MW)	Frequency (Hz)	Length (m)	Weight (kg)	Material	Status
TE Connectivity	TE Connectivity	10.5	1000	1.1	50	100	100	Aluminum	Qualified
ABB	ABB	10.5	1000	1.1	50	100	100	Aluminum	Qualified
Siemens	Siemens	10.5	1000	1.1	50	100	100	Aluminum	Qualified

TABLE 4.1: Gas Compression Technology

Table 4.1: Gas Compression Technology

Attribute	Installed or Qualified	To be Qualified within 5 yrs.
Water Depth	0 - 3000 m (0 - 9842 ft)	0 - 3000 m (0 - 9842 ft)
System Capacity	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)
System Pressure	0 - 100 bar (0 - 1450 psi)	0 - 100 bar (0 - 1450 psi)

TABLE 4.2: Subsea Boosting Technology

Table 4.2: Subsea Boosting Technology

Attribute	Installed or Qualified	To be Qualified within 5 yrs.
Water Depth	0 - 3000 m (0 - 9842 ft)	0 - 3000 m (0 - 9842 ft)
System Capacity	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)
System Pressure	0 - 100 bar (0 - 1450 psi)	0 - 100 bar (0 - 1450 psi)

TABLE 4.3: Two Phase Separation Technology

Table 4.3: Two Phase Separation Technology

Attribute	Installed or Qualified	To be Qualified within 5 yrs.
Water Depth	0 - 3000 m (0 - 9842 ft)	0 - 3000 m (0 - 9842 ft)
System Capacity	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)	0 - 250,000 m³/d (0 - 7,766,000 bbl/d)
System Pressure	0 - 100 bar (0 - 1450 psi)	0 - 100 bar (0 - 1450 psi)

Up to 100% increased production rate from the industry's only subsea multiphase boosting systems

Delivering increased recovery requires a reliable subsea processing solution that is designed on the premise of the reservoir. OneSubsea presents the most comprehensive suite of products providing scalable subsea processing and boosting system solutions for all environments, including extreme conditions up to 15,000 psi and 3000 meters water depth.

With more than 30 operating systems in sub-seas regions from the North Sea to Australia, West Africa to Brazil, OneSubsea has a portfolio of proven, reliable boosting and pumping systems successfully increasing production rates from 30% up to 100% for operators. Visit [www.onesubsea.com/pumpingystems](http://www.onesubsea.com/pumpingystems)

Enabling Subsea Processing by Connecting Innovation with Experience

siemens.com/energy/subsea

Reliable Seabed Boosting With Subsea Multiphase Pumps and Motors

FLOWERVE

Innovative Hydraulic Submersible Pump (HSP) Technology from SPX

SPX

Reliable Seabed Boosting With Subsea Multiphase Pumps and Motors

ABB

Reliable Seabed Boosting With Subsea Multiphase Pumps and Motors

ABB

Reliable Seabed Boosting With Subsea Multiphase Pumps and Motors

ABB