Long experience with high competence

ABB is a leading supplier of electrification solutions to the Oil & Gas industry and offers a range of specialized electric power systems, drives and services for critical further and deeper water production equipment.

Oil and gas reservoirs are no longer easy to find close to the shore. The industry facing a number of key challenges, such as high cost and risk, low efficiency, reliability and non-sustainable issues.

ABB INSUBSEA® Long step-out system provide a low-cost solution to brownfield extensions and a cost-effective solution to greenfield developments. The system includes drive and control seaward compressors and pumps that can sit up to 150 km away from topside infrastructure. Designs are customized to customer requirements.

Long step-out system apply to:
- Re-use and upgrade of existing infrastructure
- Tie-in of remote pockets of resources
- Increased production capacity, recovery rates, and tail production
- Shore-to-subsea developments
- Subsea processing
- Deepwater developments
- Export applications

ABB’s specialists have a thorough understanding of the power requirements for subsea applications such as boosting and separation, and add high-value expertise to both system and application engineering. Analyzing the system usage under both steady state and dynamic conditions provides great risk reduction with regards to dimensioning of the equipment. All through advanced steady state and dynamic calculations, the design studies includes:

Steady state calculations
- Fundamental load-flow of each system component
- Voltage drop within the system in steady state for a defined load condition
- System Impedance curve
- Transfer function of motor voltage/converter voltage
- Flux correction factor

Start-up calculations
- Calculate boost factor for motor, subsea transformer and step-up transformer for defined breakaway torque
- Verify start current
- Verify that the specified breakaway torque is achieved during start-up

Calculation results
- Voltages and currents at different points in the system
- Harmonic analysis of voltages at different points in the system
- Transformer flux at start-up

Typical configuration for an INSUBSEA Long step-out consist of:
- Umbilical grounding and isolation switchgear
- Variable Speed Drive (VSD)
- DriveMonitor™, remote diagnostics
- Control and Protection system - HMI/Local Information system
- Top-side and subsea transformers
- Measurement and data acquisition system
- Wet-mate connection system
- Subsea structures and protection
- HV power umbilical
- Maintenance system
- Remote diagnostic system

Produced and backed by ABB

INSUBSEA Long step-out system are based on ABB’s standard frequency converters and special designed transformers, adapted to meet the stringent requirement of topside or subsea installation. All ABB subsea equipment is backed by ABB’s standard frequency converters and special designed transformers, adapted to meet the stringent requirement of topside or subsea installation. ABB subsea equipment is backed by the resources of our global product support organization as well as our dedicated subsea electrification specialists. Topside drive systems with long subsea cable run are complex and difficult to design. We have extensive knowledge and experience with subsea electrical power systems and have conducted studies and design of subsea cable runs up to 47 km, with electrical system design studies from ABB, offshore operators can be assured that the total subsea electrical system, power network and all components are properly engineered and dimensioned for optimal short- and long-term performance.

INSUBSEA Long step-out system will support oil and gas companies to cope with the challenges that they are facing by improve cost efficiency, increase production and flow assurance, minimize risk and environmental impact, extend the capacity lifespan of oil and gas fields.

Åsgard – new world record from ABB

Åsgard is on the Haltenbanken of Norway in water depths of 240–310 m (787–1017 ft). Gas and condensate from the Midgard and Mikkel reservoirs are transported through long distance flow lines to the Åsgard B platform. ABB’s solution provides the power to the world’s first subsea gas compression system. The system will be able to send 15 megavolt amperes at 189 hertz over 43 km (26½ mi). That sets a new world record for distance, voltage and frequency between a drive on a floating production facility and seabed compressor. Åsgard subsea gas compression is the technology of the future. Such a plant will facilitate remotely controlled hydrocarbon transportation. Current topside operations will thus be moved to the seabed, allowing oil and gas to be recovered that would not otherwise be profitable. This is an important element of increased recovery on the Norwegian continental shelf.

Project facts
Field Operator: Statoil
Application: Subsea compression module
Field: Haltenbanken
ABB Scope: subsea transformers, topside variable frequency drives and topside transformers