

# World's first power-from-shore dynamic AC cable Gjøa floating oil and gas platform, North Sea



Photo: Statoil

- World's first floating platform to be powered from onshore
- Less costly and more efficient solution than gas turbines
- Displaces 210,000 tons of CO<sub>2</sub> emissions a year

#### Scope of supply

- Project management
- Cable system design, engineering and manufacture
- Cable installation
- Installation of cable joints and transition joints
- Testing and commissioning

#### Cable data

Voltage	115 kV AC
Power	40 MW
Length	98.5 km static submarine XLPE cable (Cu) 1.5 km dynamic submarine XLPE cable (Cu)
Customer	Statoil Norge AS
Completion	2010



### Customer needs

Gjøa is the largest oil and gas development project in the North Sea for several years. Production at the field began in 2010 via a semi-submersible platform located off the Norwegian coast. The floating production facility is owned by Statoil and operated by GDF SUEZ E&P Norge.

Oil and gas platforms typically use gas turbines to generate the electric power needed for platform and subsea operations. Gas turbines have a number of disadvantages: they consume large volumes of gas that could otherwise be sold, produce large quantities of CO<sub>2</sub> emissions, have significant and costly space and weight requirements, and require regular maintenance.

Statoil prioritizes the use of emission-free hydropower from the Norwegian grid to power offshore production facilities and reduce the cost and carbon footprint of its operations. However, powering a floating platform with electricity from onshore had never been attempted before, and an AC cable sufficiently robust to withstand the mechanical stress of floating applications did not exist. Statoil awarded ABB the contract to provide an innovative power cable solution for Gjøa.

### Why ABB?

Statoil and ABB have pioneered the use of power-from-shore technology in the North Sea.

In 2005 ABB provided Statoil with the world's first high-voltage direct current (HVDC) power-from-shore solution for the huge Troll A gas platform in the North Sea. ABB HVDC Light cables transport hydropower from the Norwegian grid to the platform, a distance of 70 km. There, the electricity powers two ABB 40 MW very high-voltage motors, which drive gas compressors that pump the gas onshore. The ABB solution enables Statoil to avoid the use of gas turbines and displace annual CO<sub>2</sub> emissions of 230,000 tons.

Following the success of the solution, BP selected ABB to provide an HVDC Light power-from-shore solution for its multi-platform Valhall complex in the North Sea. BP estimates the solution to have saved \$44 million in installation costs, \$7 million in annual operating costs, and avoided CO<sub>2</sub> emissions of 300,000 tons a year.

Gjøa is the third platform in the North Sea to be powered with electricity from the Norwegian grid. ABB has been involved in all three projects.

### The ABB solution

Gjøa is a floating production facility located 380 m above the seabed. Most of the subsea cabling consists of an AC static cable along the seafloor for a distance of 98.5 km. A 1.5 km dynamic cable links the static cable to the platform.

Although moored to the seafloor, the platform is buffeted by the wind and waves and can move as much as 75 meters to one side. This subjects the dynamic cable to substantial mechanical stress and the risk of fatigue.

Working closely with Statoil, ABB developed a solution that is designed to withstand the extreme conditions and have an operating life of at least 35 years. An important feature of the design is the replacement of the conventional lead sheath, which is not sufficiently robust for this application, with a new innovative sheath.

At 100 km, this is the longest AC submarine cable in the world to be installed in one complete length and at this voltage. It opens up a new era for the offshore oil and gas industry by enabling - for the first time - a floating production facility to be powered entirely with electricity from onshore.

ABB is currently delivering a 106 km AC submarine cable with a power rating of 123 kV and 75 MW for the Goliat oil and gas platform in the Barents Sea. Scheduled for completion in 2013, the power-from-shore link will be the longest, most powerful cable ever delivered for an offshore location.

### Customer benefits

- Cost-effective, high-efficiency, zero-emissions solution
- Pioneering technology and complete cable solution from the market and technology leader in high-voltage cables and power-from-shore solutions
- All cable components tested and manufactured by ABB
- Complete ABB scope of supply, from R&D to installation and testing

For more information please contact:

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