

# Horns Rev 1

*Subsea connections for the world largest offshore wind farm 2002*

Global Marine Systems Limited made the vital connections at Horns Rev, the world's largest offshore wind farm. Working in harsh environmental conditions up to 20km into the North Sea, Global Marine Systems was responsible for installing and burying power cables up to two metres below the seabed and making 160 cable connections for the wind farm's 80 turbines.

## The Project

During the summer of 2002, the world's largest offshore wind farm was constructed off the coast of Denmark at Horns Rev. Global Marine Systems was contracted to undertake the laying and burial of all power cables within the wind farm site including connections to the turbines.

The Horns Rev wind farm site is located 14km and 20km off Blavandshuk on the west coast of Denmark close to the port of Esbjerg. The farm consists of eighty Vestas V80 2MW turbines each placed 560 meters apart in ten north-south rows of eight machines and the water depth at the site is between 6.5 and 13.5 meters.

Global Marine Systems was responsible for installing 100mm diameter cable for installing 100mm diameter cable to link the turbines, as well as 130mm diameter cables to link each block of sixteen turbines to a transformer platform from which the power is transmitted ashore. The cables were buried to a target depth of 2m below the seabed for optimum protection.



## The Challenge

The large number of cable terminations required is what made this project different from any other offshore cable laying project in other industries. At Horns Rev, Global Marine Systems had to make 150 landings, which involved pulling the cable from the sea-bed, through the protective J-tube and fixing it inside the turbine.

A significant feature of the cable installation work at Horns Rev was the vast number of people transfers at sea and the extensive requirements for diver operations. Consequently, the safety of people was the primary consideration when deciding if conditions were suitable for operations to proceed.

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Global Marine Systems understood that the success of the operation would be largely dependent on the establishment of a slick logistical operation. Throughout the project, Global Marine Systems had multiple vessels employed at the site and up to 90 people working on a 24 hour basis. Eighty cable lengths, mainly on drums had to be supplied to the cable installation spread whenever required, to ensure work continued around the clock.

## **The Verdict**

Horns Rev can, without doubt, be classed as a pioneering project in the field of offshore wind generation. It is four time larger than any other offshore wind farm in the world, and is the first commercially sized wind farm to be placed in a truly offshore environment. Global Marine Systems is now uniquely positioned in terms of skills and experience to assist developers throughout the world with their offshore wind farm projects.