



SHELL IN NIGERIA

BONGA DEEP WATER PROJECT

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Unlocking Nigeria's offshore energy in deep water

In November 2005, The Shell Nigeria Exploration and Production Company Limited (SNEPCo) began to produce oil and gas at Bonga, 120 kilometres (km) offshore Nigeria in the Gulf of Guinea. The project – the country's first in deep water – increased Nigeria's oil capacity by 10%.

First discovered in 1995, Bonga lies in water 1,000 metres deep across an area of 60 square km. It has the capacity to produce more than 200,000 barrels of oil a day and 150 million standard cubic feet of gas a day. By the end of March 2010, Bonga had produced over 280 million barrels of oil.

Bonga has set new standards for the Nigerian energy industry. The skills and technology we have used here could enable Nigeria to become a major offshore producer and help meet global demand for energy long into the future.

The Bonga field supplies gas to the Nigeria Liquefied Natural Gas Company Limited (NLNG) at Bonny Island, from where it is exported to European and other markets. Oil is exported globally from the Bonga FPSO – the giant floating, production, storage and offloading vessel that is at the heart of the field's development.

Advanced technology and engineering

Bonga is one of the world's largest FPSOs. Three hundred metres long and the height of a 12-storey building, Bonga's deck is the size of three football fields. It receives crude from production wells on the seabed. The oil is processed onboard, stored and then sent to the single point mooring (SPM) – a buoy anchored nearby that is used to load it onto tankers for export. When fully laden with oil, Bonga weighs 300,000 tonnes. It is held in place by 500 – tonne anchors linked by 20 km of high-strength chains.

Constructing Bonga was an international effort involving thousands of workers across the globe. Samsung Heavy Industries built the hull in South Korea. Tug boats then towed it 24,000 km via Egypt's Suez Canal to Wallsend in the north of England, where it was fitted with processing equipment modules before making its final journey to Nigeria where the last of the equipment was installed.



Nigerian content

Nigerian companies contributed significantly to the success of the Bonga project. Three of the Bonga modules were designed and built in Nigeria. The foundation piles for the FPSO, the risers and the giant single point mooring buoy which was at the time, the largest in the world for deepwater operations, weighing about 870 tonnes – were also built in Nigeria.

The project helped create the first generation of Nigerian oil and gas engineers with deep-water experience. When it began, Nigeria had few contractors with the technical capacity or scale to support the development. SNEPCo began training Nigerian operation and production engineers for Bonga in 1999. By the end of 2010, some 90% of Bonga's core offshore staff were Nigerian. Bonga also stimulated the growth of support industries vital to offshore deep-water projects. Nigerdock's Snake Island facility in Lagos was developed as a support base for Bonga's operations and a modern onshore base for subsea equipment testing and maintenance was established at Onne in Rivers State in the Niger Delta. Together these have helped create jobs and provide a range of training and maintenance services to the offshore industry. Also at Onne, a contracting company has built an ultra modern facility to coat and insulate pipes –



A side view of the Bonga Floating Production Storage and Offloading vessel (FPSO)

essential to withstand deep-water conditions. The project also benefited the wider economy by boosting demand for a range of goods and services including boats, materials, floating hotels, helicopters and manpower.

Bonga today – innovating

SNEPCo is working on the Bonga Main Integrated Project (BMIP) – that will allow the Bonga FPSO to operate at full capacity for longer. The BMIP project is intended to develop deposits to the northwest of the original Bonga production area. These additional reserves lie in average water depths of 1000 -1200 meters. BMIP merges various smaller projects and will involve drilling 36 new wells.

As follow up to successfully conducting Nigeria's first-ever four-dimensional (4D) deepwater seismic survey in 2008, SNEPCo undertook a repeat survey in the Bonga field in November 2010.

The latest survey involved the placement of autonomous sensors on the sea bed, beneath and around the Bonga FPSO. This procedure enhances the overall imaging of reservoirs thousands of metres beneath the sea bed, and gives Petroleum Engineers and Geoscientists a better understanding of oil and water movements therein. The surveys are a good example of the important contribution Shell companies in Nigeria are making to deepwater technology deployment in Nigeria.



Bonga topside

More information on the operations of Shell companies in Nigeria can be found at shellnigeria.com

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