Field : **VIBRATION AND ACOUSTIC ISOLATION**

Operation in the gulf of Guinea

The AKPO field, which was discovered in 2000 and is being operated by TOTAL, is a gas condensates deposit located about 200 km offshore from Port Harcourt, at depths of between 1,100 and 1,700 metres beneath the ocean's surface. SOCITEC was consulted in order to define and manufacture 4 Diesel generator sets/alternating current back-up generators for the operating platform.

THE AKPO PROJECT

AKPO's development includes 22 production boreholes, 20 water injection boreholes and 2 gas injection boreholes linked to a Floating Production, Storage, and Offloading (FPSO) processing unit. The 310 metre-long and 61 metre-wide FPSO unit will have a storage capacity of two million barrels of crude oil, a deck designed for the installation of 17 treatment and separation modules, and living quarters that can house 240 people.

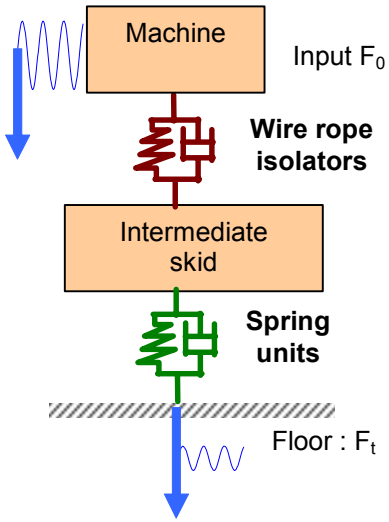
The firm TECHNIP, which was awarded the contract for engineering, the supply of equipment, construction and the commissioning of the FPSO unit, assigned SOCITEC the isolation of vibrations generated by the diesel generator sets/alternating current generators.

HIGHLY DEMANDING SPECIFICATIONS

The type of electric generating set adopted by TECHNIP is a model by 2H ENERGY providing 2 MW, measuring 10 x 4 x 4 m, and with a total weight of approximately 50 tons.
The Diesel/alternating current generators' vibration excitation speed was given for 30 mm/s. In order to limit the transmission of these vibrations to the FPSO unit's living quarters nearby, it was specified that the residual level on the support floor must not exceed 0.3 mm/s, or filtering with a ratio equalling at least 100.
Maintenance work is limited solely to the electric generator sets. The suspension must therefore operate in an offshore environment without any maintenance throughout the FPSO unit's operating period.

WIRE ROPE ISOLATOR AND SPRING UNIT

The isolation ratio specified quickly led to the design of a two-stage suspension :



- A first stage consisting of Spring-POLYCAL Boxes (compression springs + POLYCAL wire rope isolator).
- A second stage consisting of HELICAL wire rope isolators.

Frequencies decoupling specific to each stage subject to a ratio of 2 enables isolation of at least 40dB to be guaranteed.
The isolators' non-linearities and dry friction limit excess tensions due to resonance and ensure better dissipation of the energy transmitted.
The robustness and reliability of SOCITEC's all-metal isolators guarantee a nearly unlimited life span.

EVEN BETTER THAN EXPECTED !

In order to validate the design and the SOCITEC isolators, TECHNIP called on the firm VIBRATEC, which specialises in vibration and acoustic measurements and calculations.
In May 2006, the electric generator set was installed on its suspension units and fitted with acceleration sensors at 2H ENERGY's premises in Fécamp.
Recordings of the excitation source on the motor, and of the residual value at support surface level confirm the very high degree of effectiveness of SOCITEC's solution, with effective velocity values which were substantially lower than the threshold specified.

The FPSO unit will be ready for start-up by the third quarter of 2008.

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