ClampOn, Norway booth 5031

ClampOn is a Norwegian company with headquarters in Bergen, Norway and a subsidiary in Houston, USA.

In 2012 ClampOn delivered its instruments (sand monitor, pig detector, leak monitor, corrosion-erosion monitor and vibration monitor) to more than 38 countries, both for topside and subsea applications. Customers included operators worldwide such as Total, ENI, Shell, Chevron, Woodside, INPEX, Murphy Oil, BG, Petrobras, CNOOC, Burullus, Statoil, BP, Maersk Oil, Exxon Neftegas, Gasco, ADMA Opco, Nexen, GDF Suez, Shell, LLOG, ExxonMobil and Premier Oil.

Also in 2012, ClampOn finished the development of a magnetic solution that made it possible to install the ClampOn Subsea 3D Vibration Monitor on existing infrastructure. The instrument is a non-intrusive vibration monitoring system for quick and robust ROV installation in class 1 - 4 valve funnels. It monitors the vibration in all three axis in the frequency range from 0 Hz to several hundred kHz, depending on the application. The vibration monitor has been designed in a robust simple structure with magnetic clamping arrangement that enables tremendous flexibility in terms of installation. It can be fitted to structures where traditional mechanical means of installation are not possible or very time-consuming and expensive. This is an advantage if an operator wishes to monitor vibration for a brief period. It allows for the complete system to be installed quickly by ROV on existing structures, even where there is no power or data interface available, something which has not been possible before.

ClampOn Subsea 3D Vibration Monitor, combined sand and vibration.

Vibrations can cause expensive downtime and in worst case, fatal accidents. The ClampOn Subsea 3D Vibration Monitor monitors three directional vibrations on structures and pipelines with either high frequency shear waves or low frequencies. Typical output formats include:

- 3-axis vibration spectrum (acceleration, velocity or displacement).
- 3-axis raw acceleration data, up to 2000 samples/second.
- Peak acceleration and RMS velocity.

The system is set up to provide measurements as an FFT where the amplitude represents acceleration. Each frequency bin will contain the maximum and average from all axes – X, Y and Z. Measurements carried out by the ultrasonic element will have maximum and average values, calibration will ensure that the readings provided are the correct frequency and acceleration response.

The system was first tested in the Gulf of Mexico, and was in 2012 deployed in the North Sea where the operator suspected vibration, which could lead to reduced production rates or damaging of the flowlines. The readings are giving the operators good control of the situation. Another installation >>>

ClampOn Subsea 3D Vibration Monitor, standalone magnetic solution.

April 2013

was in the Caspian Sea to diagnose a 28 in. flapper non return valve on a main gas export line. The monitor was installed in an existing torque-tool and held in place by a magnetic clamp. It measured valve chatter allowing the operator to identify the production rates at which this occurred. They were thereby able to avoid these rates and thus eliminate vibration in the structure.

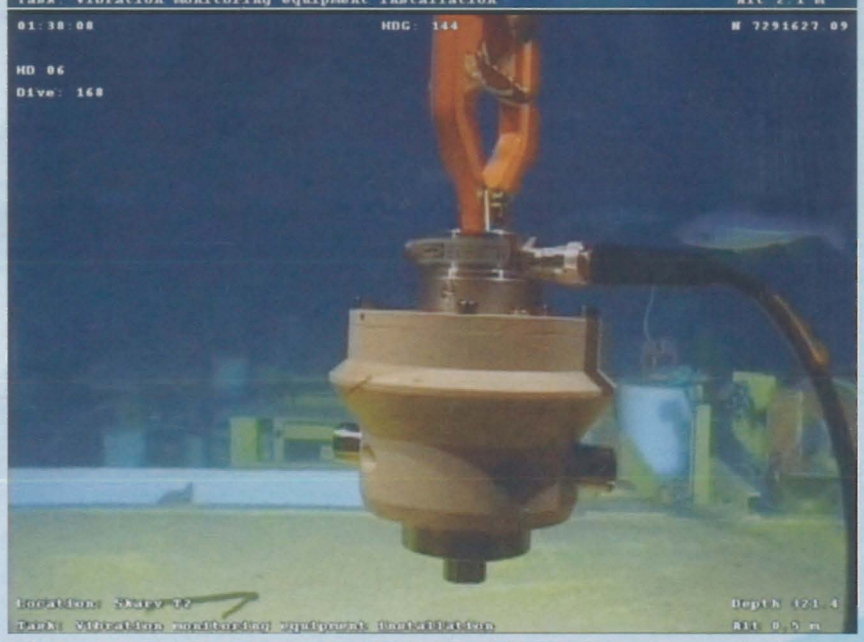
Operators can use the vibration system to monitor vibration from vortex induced vibration, flow induced excitation, acoustic fatigue, surge/momentum changes due to valve operations, stress during extreme weather, subsea pumps or other subsea equipment or structures.

Vibration monitoring can also be combined with other ClampOn products, such as sand monitoring, pig detection or ultrasonic spectrum analysis

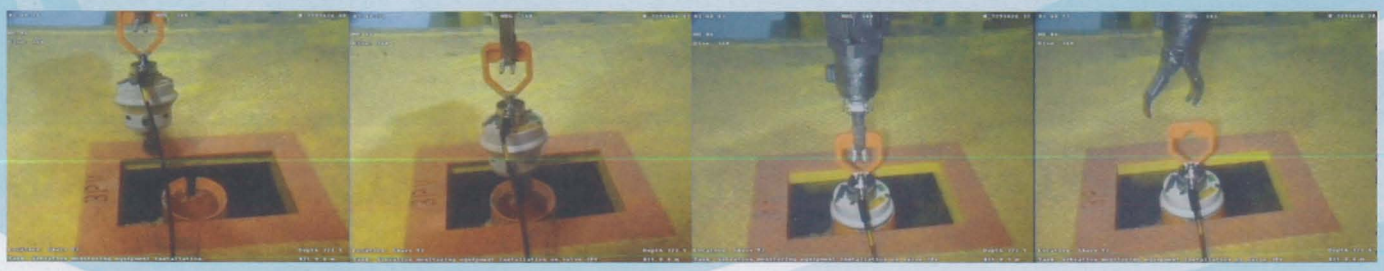
The ClampOn Subsea 3D Vibration Monitor will be demonstrated at ClampOn's booth #5031 at OTC.

What technology, region or innovation does ClampOn predict will be important in 2013?

ClampOn's focus products for 2013 are: the ClampOn Subsea Corrosion-Erosion Monitor, for which we last year received the OTC Spotlight on New Technology Award for and the ClampOn Subsea 3D Vibration Monitor.



Vibration monitor with magnetic clamp, being installed by ROV.



Instrument being installed in class 4 valve bucket on manifold.